

II Semester

ADVANCED KNITTING AND NON-WOVEN TECHNOLOGY			
Course Code	MJTT201	CIE Marks	50
Teaching Hours/Week (L:P: SDA)	3:0:2	SEE Marks	50
Total Hours of Pedagogy	50	Total Marks	100
Credits	04	Exam Hours	03
Course Learning objectives:			
Student will have an in-depth knowledge about warp knitting and non- woven fabric production. It will update the knowledge about modern aspects of warp knitting and non-woven production and application.			
Module-1			
Warp knit fabrics; warp knit v/s woven construction, Single needle bar structure and working mechanism, pattern mechanism. Five basic overlap / under lap variations, closed lap and open lap, direction of lapping at successive courses. Classes of warp knitting machinery, knitting cycle, Tricot, Raschel machines. Knitting elements in Raschel machine, knitting cycle in Raschel Knitting action of the single needle bar Raschel and compound needle.			
Module-2			
Knitting elements of Tricot machines, knitting cycle in Tricot machine. Plain Tricot structures, knitted with two full set guide bars, twobar Tricot, Shark skin, Queens cord, Velour and Velvet structures, Satin, overfed pile structures, reverse lock knit. Differences between Tricot and Raschel machines and fabrics.			
Module-3			
Modified warp knit machines and fabrics: Fall plate and chopper bar Raschel, co-we-nit, weft insertion in knitting. Pattern controlling mechanism, pattern wheels, electronic jacquards. Yarns for warp knitting: -Materials for warp knitting, filament and spun yarns, unconventional yarns, important yarn properties for Warp knitting, winding and warping for warp knitting. Faults in warp knits. Warp knitting calculations.			
Module-4			
Classification of non-wovens, preparatory machines for non-wovens fabric Production. Effects of fiber arrangements in the web. Methods and technique used in non-woven production, needle punched, stitch bonded, and adhesive bonded wet laid spun bonded, spun laced laminated and moulded fabrics. Classification of binders and their properties, effect of fiber properties on nonwovens. Modern developments in non-woven productions.			
Module-5			
Structure of non-wovens: web geometry, fiber orientation curl factor, web density. Identification, properties and application of different non-wovens. Methods of tests: porosity, tear strength, air permeability, tensile strength, 3-point bending test, fatigue test, CBR Loading, cone puncture test, absorbency test, peeling test, pilling test, study of DIN standards.			

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 50% of the maximum marks. Minimum passing marks in SEE is 40% of the maximum marks of SEE. A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 50% (50 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation:

1. Two Unit Tests each of **25 Marks**
2. Two assignments each of **25 Marks** or **one Skill Development Activity of 50 marks** to attain the COs and POs

The sum of three tests, two assignments/skill Development Activities, will be **scaled down to 50 marks**
CIE methods /question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.

Semester-End Examination:

1. The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 50.
2. The question paper will have ten full questions carrying equal marks.
3. Each full question is for 20 marks. There will be two full questions (with a maximum of four sub-questions) from each module.
4. Each full question will have a sub-question covering all the topics under a module.
5. The students will have to answer five full questions, selecting one full question from each module

Suggested Learning Resources:**Books****Web links and Video Lectures (e-Resources):**

NPTEL COURSES on Weaving Technology and Non-Woven Technology.

<https://nptel.ac.in/courses/116102005> <https://nptel.ac.in/courses/116102014>

Skill Development Activities Suggested:

1. Demonstration of single jersey, rib knitting machines and knitting elements,
2. Demonstration of Interlock knitting machines, yarn feeding and cam on knitting machines
3. Analysis of knitted fabrics for WPI, CPI Stitch Density, Stitch Length, Loop Shape Factor
4. Analysis of knitted fabrics for loop design; loop diagram feeder diagram, and graphical motion.

Course outcome (Course Skill Set)

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

Sl. No.	Description	Blooms Level
CO1	Define and explain the basic elements and structures of weft knitting	L1
CO2	Summarize and discuss weft knitting machines and their Ornamentation of weft knit structures	L2
CO3	Explain in depth derivatives of plain and rib structures and weft knit designs.	L2
CO4	Summarize and discuss the aspects of knitted fabric geometry.	L2
CO5	Explain warp knitting machine and their structures	L2

ADVANCED APPAREL PRODUCTION TECHNOLOGY			
Course Code	MJTT202	CIE Marks	50
Teaching Hours/Week (L:P:SDA)	2:0:2	SEE Marks	50
Total Hours of Pedagogy	40	Total Marks	100
Credits	03	Exam Hours	03
Course Learning objectives: Course aims at developing knowledge in advanced aspects of garment manufacturing including pre and post processing techniques			
Module-1			
The nature and scope of apparel manufacturing: Types of apparel manufacture-fundamentals of apparel production. Basic types of apparel production process - major function of apparel manufacturing – engineering functions, management functions- apparel trade association. Computerized pattern making in garment production. Principle of pattern making, garment balance, Size charts, pattern grading, computerized made to measure system, Technological advances in pattern making, Gerber technology, Lectra systems, material utilizations, application/developments in computer aided apparel systems, Future trends. Computerized cutting, marker quality and geometric principle for calculating optimum marking design, principles of stitch, seam and their analysis, seam quality, computerized sewing, pressing and moulding.			
Module-2			
Advances in apparel product development: Industrial change process model for clothing product development, models of new product development, product development tools and application area product life time management (PLM) Demand Led new product development future trends. Technological advances in sewing garment: History of sewing development of the industrial saving, machine advances in sewing needle design, advances in sewing thread technology, Advances in sewing machine automation, semi-automatic sewing equipment, machine using computer numerical control. Future trends in cloth technology.			
Module-3			
Development in pressing technology for garment finishing: The pressing process, pressing with pressure pressing without pressure, crease resistant finishes and permanent creasing future trends. Packaging and ware housing: Type of packing and packing materials, quality specification, merchandise packing and shipping packing. Intra transport, ware housing, computerized storage systems.			
Module-4			
Production control: Production analysis, distribution of documents and records, types of control forms, producing many styles in one line and determining supervisory sections in production lines. Production control charts, reports, production grid principle for assigning partial production, line operators			
Module-5			
Indian apparel industry: Overview of technology in apparel manufacturing technology, usage, regional features and structures of the industry, Indian apparel export and important product category, domestic market and domestic brands, technology status and outlook. Apparel productivity- Apparel productivity in India and Western world, global comparison characteristics of low, medium and high productivity manufacturers and factors associated with productivity actions towards higher productivity			

Assessment Details (both CIE and SEE)

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Continuous Internal Evaluation:

1. Two Unit Tests each of **25 Marks**
2. Two assignments each of **25 Marks** or **one Skill Development Activity of 50 marks** to attain the COs and POs

The sum of three tests, two assignments/skill Development Activities, will be **scaled down to 50 marks CIE methods /question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.**

Semester-End Examination:

1. The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 50.
2. The question paper will have ten full questions carrying equal marks.
3. Each full question is for 20 marks. There will be two full questions (with a maximum of four sub-questions) from each module.
4. Each full question will have a sub-question covering all the topics under a module.
5. The students will have to answer five full questions, selecting one full question from each

Suggested Learning Resources:**Books**

- 1) Apparel Manufacturing Hand book: Analysis, Principles and Practice – Jacob Solinger, Van NostrandReinhold Company 1981.
- 2) Managing Productivity in the Apparel Industry – Rajesh Bheda, CBP Publisher
- 3) The Technology of Clothing Manufacture, Harold Carr and Barbara Latham, John Wiley & Sons
- 4) Seams Productions and Analysis -Radh D Clock
- 5) Advances in Apparel Production -Ed. by Catherine Fair Hurst, Textile Institute, Wood head PublicationsLimited, Cambridge

Web links and Video Lectures (e-Resources):

visit to garment industries to study various aspects of modern garment manufacturing techniques

Skill Development Activities Suggested:**Course outcome (Course Skill Set)**

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

Sl.No.	Description	Blooms Level
C01	Explain different types of apparel manufacture systems, Principle of pattern making, pattern grading, computerized made to measure system	
C02	Explain product development tools product life time management (PLM) Demand Led new product development future trends.	
C03	Summarize the pressing process, Merchandise packing and shipping. Intra transport, ware housing, computerized storage systems.	
C04	Summarize production control charts, reports, production grid principle for assigning partial production, line operators.	
C05	Explain Indian apparel export and importance of product category domestic market, Apparel productivity.	

ADVANCED MANUFACTURED FIBER TECHNOLOGY			
Course Code	MJTT203	CIE Marks	50
Teaching Hours/Week (L:P: SDA)	3:0:0	SEE Marks	50
Total Hours of Pedagogy	40	Total Marks	100
Credits	03	Exam Hours	03
<p>Course Learning objectives: This Course aims at updating knowledge of students in fields of</p> <ul style="list-style-type: none"> • High performance fibres, high function fibres and developments in conventional man-made fibres • Post spinning operations. • Advanced concepts in MMF spinning. 			
Module-1			
Structural principles of fibre forming polymers. Rheology and hydrodynamics in MMF spinning. Development of fibre structure during man-made fibre spinning. Study of various variables in melt spinning and effect of various parameters on linear density of fibres			
Module-2			
High speed melt spinning: One step (SP) and two step spinning (TSP) process. Study of fluid flow in spin line. Modifications to be done in spinning, mechanism for high speed melt spinning. Recent developments in dry and wet technology. Study of various types of spinnerets, orifices used for MMF spinning. Mechanism of crystallization during MMF Spinning.			
Module-3			
Melt spinning of Hollow, Multi component, Ultra-fine and Nano fibres. Spin finish application: Composition of spin finish, various methods of spin finish application, spin finish for staple fibre production.			
Module-4			
Detailed study of mechanism of heat setting of synthetic fibres. Study of property changes in synthetic fibres during heat setting. Study of various physical and chemical methods of modifications of PET, NYLON & Acrylic fibers.			
Module-5			
New fibres: Introduction to various high performance fibres, Kevlar-LCP behavior, dry jet spinning of Kevlar fibres, Carbon fibres, raw materials, chemistry of production, surface treatments. Recent trends in production of high performance fibres like Boron, Silicon, Glass, PBT, PBZO, PBZT and aromatic polyesters. High tech fibres, biomimetic chemistry and fibres, biotechnology and fibres, electronics and fibres, fibres in sports, fibres in ocean.			
Assessment Details (both CIE and SEE)			
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Continuous Internal Evaluation:

1. Two Unit Tests each of **25 Marks**
2. Two assignments each of **25 Marks** or **one Skill Development Activity of 50 marks** to attain the COs and POs

The sum of three tests, two assignments/skill Development Activities, will be **scaled down to 50 marks**

CIE methods /question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.

Semester-End Examination:

1. The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 50.
2. The question paper will have ten full questions carrying equal marks.
3. Each full question is for 20 marks. There will be two full questions (with a maximum of four sub-questions) from each module.
4. Each full question will have a sub-question covering all the topics under a module.
5. The students will have to answer five full questions, selecting one full question from each module

Suggested Learning Resources: Books

1. High Speed Fibre Spinning"-AndrzejZiabicki, Hiromichi Kawai,KriegerPublishingCompany,1991
2. Fundamentsoffibreformation"-AndrzejZiabicki,Wiley,1976
3. Manmade fibres: Science and Technology", Vol. I, II and III – HF Mark, SM Atlas and E Cernia Interscience Publishers, NY
4. Manufactured Fibre Technology"-Ed. By V. B. Guptaand V K Kothari, Chapmanand Hall,London,1997
5. New Fibres -T. Honguand GO Phillips, Ellis Horwood, New York 1990.

Web links and Video Lectures (e-Resources):

<https://nptel.ac.in/courses/116102006>

Skill Development Activities Suggested:

Analysis of fabrics made from special fibres, doing case studies in synthetic fibre production centres, reviewing literature on recentdevelopments in fibre production.

Course outcome (Course Skill Set)

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

Sl. No.	Description	Blooms Level
C01	Illustrate synthetic fibre production	L2
C02	Demonstrate high speed spinning	L2
C03	Explain ultra-fine, bicomponent and micro denier fibres	L2
C04	Describe post spinning operations	L2
C05	Explain various new functional fibres	L2

ADVANCED WET PROCESSING			
Course Code	MJTT204	CIE Marks	50
Teaching Hours/Week (L:P: SDA)	3:0:0	SEE Marks	50
Total Hours of Pedagogy	40	Total Marks	100
Credits	03	Exam Hours	03
Course Learning objectives:			
<ul style="list-style-type: none"> • Explain the dye fibre interaction, diffusion coefficient and theories of dyeing • Demonstrate methods, standards, principles and working of chromatographic techniques used for testing of dyes, chemicals and textiles. • Explain influence of dyes and chemicals on textiles. • Describe various dyeing machineries used for garment processing • Demonstrate various methods of fabrics finishing with speciality dyes and chemicals • Explain the modern developments in natural dyeing and their applications 			
Module-1			
Dye-Fiber Interaction: Kinetics of Dyeing. The diffusion of dye inside the fiber. Fick's laws of diffusion. Theoretical basis for dye absorption. Theories of dyeing of protein and other fibers using suitable dyes.			
Module-2			
Regulations: Red listed textile chemicals, their sources and remedies. Pollution aspects of textile dyeing. Modern approaches to Eco- friendly wet processing of woven and knitted textiles. Ecofriendly dyes and their method of dyeing. Methods of analysis of formaldehyde, Pentachloro Phenol (PCP),			
Module-3			
Garment Dyeing: Modern developments in garment dyeing. Methods and machines. Low temperature dyeing of garments. Finishing of garments using different chemicals and auxiliaries.			
Module-4			
Finishing: Modern developments in finishing of natural and synthetic textiles. Finishing of textiles with various specialty chemicals.			
Module-5			
Developments: Modern developments in textile and garment printing, color measurement and computer colour matching concepts. Latest developments in natural dyes and their application on various fibers.			

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 50% of the maximum marks. Minimum passing marks in SEE is 40% of the maximum marks of SEE. A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 50% (50 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation:

1. Two Unit Tests each of **25 Marks**
2. Two assignments each of **25 Marks** or **one Skill Development Activity of 50 marks** to attain the COs and POs

The sum of three tests, two assignments/skill Development Activities, will be **scaled down to 50 marks CIE methods /question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.**

Semester-End Examination:

The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 50.

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

Suggested Learning Resources:**Textbooks**

1. Textile Colouration - C.L. BIRD
2. Textile Printing – LWC Miles.
3. Chemical Technology of Textile fibers – ER Troatman.
4. Dyeing and printing with natural dyes - M.L.Gulrajani.
5. Eco-friendly Textile wet processing-coordinator, N CUTE Publication - Dr.R.Ashokan

Reference Books

1. Environment Problems in chemical processing of Textiles, NCUTE Publication – Dr.A.Asokan, Ms.Yogita
2. Finishing of Khadi Garments - Dr.R.B.Chavan, R.Chattopadhyay, R.P.Tewari, IIT Delhi
3. Instrumental Colour measurement and computer aided colour matching for textiles, H.S. Shah & Gandhi.

Web links and Video Lectures (e-Resources):

- NPTEL course and lecture series: <https://nptel.ac.in/courses/>
- You Tube simulation videos, etc.
- <https://www.youtube.com/watch?v=uZN0iLLAaww>
- https://www.youtube.com/watch?v=g8_GvRoASV0

<https://www.youtube.com/watch?v=9ND67gfwAyg>

Skill Development Activities Suggested

- Students can collect fibres, yarns, fabrics and garments, dyed with eco-friendly dyes from textile and apparel industry and studying the same.
- Practical exposure in wet processing of fibres, yarns and fabrics with eco-friendly dyes and chemicals
- Students can visit and observe working of advanced fabric wet processing machineries in industries. Seminars, quizzes, group discussions and report writing on modern wet processing concepts.

Course outcome (Course Skill Set)

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

Sl. No.	Description	Blooms Level
CO1	Explain the importance and necessity of dye fibre interactions and theories of dyeing	L2
CO2	Demonstrate methods, standards, principles and working of chromatographic techniques used for testing of dyes, chemicals and textiles.	L2
CO3	Demonstrate principles and working of modern garment processing machineries and methods of dyeing	L2
CO4	Describe the modern developments in finishing of textiles with speciality dyes and chemicals	L2
CO5	Explain the advanced printing of fabrics and garments, modern developments in natural dyeing and their applications	L2

ENVIRONMENTAL MANAGEMENT FOR TEXTILE INDUSTRY			
Course Code	MJTT205	CIE Marks	50
Teaching Hours/Week (L:P:SDA)	3:0:0	SEE Marks	50
Total Hours of Pedagogy	40	Total Marks	100
Credits	03	Exam Hours	03
Course Learning objectives:			
<ul style="list-style-type: none"> • Explain the source of water and their characteristics, constituents of water and their effects on textile wet processing • Demonstrate quality requirements of water for silk reeling and textile processing, conservation and reuse of water • Explain textiles effluents, characteristics of textiles processing and methods and techniques used for effluent treatments. • Demonstrate standard regulations for effluents testing parameters • Explain environmental management in textile industry, environmental pollution control norms and Biotechnology and its application in textile industry 			
Module-1			
Water: Source of water and their characteristics- surface water, ground water, rain water etc. Constituents of water and their effects on textile wet processing. Colour, turbidity, suspended solids, dissolved solids, PH value, acidity, alkalinity, hardness, iron and manganese, copper, chlorine organic growth.			
Module-2			
Quality requirements: Quality requirements of water for silk reeling and textile processing. Conservation and reuse of water. Processing chemistry - fibres, chemicals, type of chemical processing.			
Module-3			
Textiles effluent: Introduction to textiles effluent, characteristics of textiles processing, dye manufacture and synthetic fibres formation industries, reduction and pollution control at mill state. Methods and techniques used for effluent treatments.			
Module-4			
Standard regulations for effluents: Effluent testing parameters- colour and physical appearance, odour, temperature, PH value total suspended solids, total dissolved solids, BOD, COD.			
Module-5			
Environmental management: Objectives, environmental impact assessment (EIA), elements of EIA process. Important environmental laws. Environmental pollution control norms. Biotechnology and its application in environmental industries. Plasma treatments.			
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 50% of the maximum marks. Minimum passing marks in SEE is 40% of the maximum marks of SEE. A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 50% (50 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.			

Continuous Internal Evaluation:

1. Two Unit Tests each of **25 Marks**
2. Two assignments each of **25 Marks** or **one Skill Development Activity of 50 marks** to attain the COs and POs

The sum of three tests, two assignments/skill Development Activities, will be **scaled down to 50 marks**
CIE methods /question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.

Semester-End Examination:

1. The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 50.
2. The question paper will have ten full questions carrying equal marks.
3. Each full question is for 20 marks. There will be two full questions (with a maximum of four sub-questions) from each module.
4. Each full question will have a sub-question covering all the topics under a module.
5. The students will have to answer five full questions, selecting one full question from each module

Suggested Learning Resources:**Textbooks**

1. Textile Effluents – Padma Vankar, NCUTE Publications, IIT, Delhi.
2. Eco friendly processing - NCUTE Publications.
3. Environmental problems in chemical processing of textiles - NCUTE Publications.

Reference Books

1. Waste water-An introduction to environmental pollution, Dr. B.K. Sharma, Krishna Prakashan, Media (P)Ltd., Meerut.
- Water pollution - V.P. Kudesia, Pragathi Prakashan, Meerut.

Web links and Video Lectures (e-Resources):

- NPTEL course and lecture series: <https://nptel.ac.in/courses/>
- U Tube simulation videos, etc.
- <https://nptel.ac.in/courses/116104045>

Skill Development Activities Suggested:

- Students can collect textiles effluents characteristics data's from testing, R & D centres, textile and apparel industry and studying the same.
- Seminars, quizzes, group discussions and report writing on modern textile processing concepts.
- Practical exposure to testing of textile effluent parameters- fibres, yarns and fabrics processing
- Students can visit and observe effluent treatment methods and techniques of textile processes.

Course outcome (Course Skill Set)

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

Sl. No.	Description	Blooms Level
C01	Explain the source of water and their characteristics, constituents of water and their effects on textile wet processing	L2
C02	Describe quality requirements of water for silk reeling and textile processing, conservation and reuse of water	L2
C03	Demonstrate textiles effluents, characteristics of textiles processing and methods and techniques used for effluent treatments.	L2
C04	Explain standard regulations for effluents testing parameters	L2
C05	Explain environmental management in textile industry, environmental pollution control norms and Biotechnology and its application in textile industry	L2

ADVANCED SILK TECHNOLOGY			
Course Code	MJTT206	CIE Marks	50
Teaching Hours/Week (L:P:SDA)	2:0:2	SEE Marks	50
Total Hours of Pedagogy	40	Total Marks	100
Credits	03	Exam Hours	03
Course Learning objectives:			
<ul style="list-style-type: none"> • To learn advances in silk fibre production, structure properties processing etc. • To learn about biomedical applications of silk, spider silk and spun silk fibres 			
Module-1			
Structure and Properties: Silk Composition of silk, amino acid composition, moisture regain, micro structure of silk, chained structure of silk, crystalline structure of silk, optical proportion of silk. Mechanical and thermal properties of silk: Tensile properties, stress-strain characteristics of silk. Visco-elastic behavior of silk, creep and stress relaxation inverse stress relaxation. Dynamic mechanical behavior and thermal behavior			
Module-2			
Indian Silk Industry and Process: Production of silk, quality of silk, problems and prospects. Present Scenario of Indian Silk Industry Production of silk produced by the other countries across the world and quality of silk produced by their Modern approach to silk cocoon production and cocoon characteristics evaluation. Recent developments in cocoon, stifling, sorting, grading, cooking and reeling. Technological developments in reeling machines and methods			
Module-3			
Production of Spun Silk: Conversion and modern approach, prospects and application, Production of Indian cottage silk and its suitability for producing traditional silk fabric with intricate designs. Production of soft silk, crepe, georgette, chiffon etc. Production of damask sand brocades and silk furnishing cloth			
Module-4			
Dyeing and Finishing: Types of dye used, factors affecting dyeing behavior of silk, preparation of silk for dyeing. Recent developments in degumming, bleaching, dyeing. Dyeing of silk with reactive, direct and natural dyes. Finishing of silk fabrics: Types and methods, modern technologies involved to impart wrinkle resistant finish, stain repellent, antimicrobial finish and other specialty finishes applicable to silk and its blends. Developments in machineries, chemicals and auxiliaries used for silk dyeing and finishing			
Module-5			
Developments: Processing of silk fibroin, filaments, hydrogels production of 3D sponges, membranes of silk, non- wovens, fluorescent silks. Biomedical applications of silk such as in sutures, wound healing, tissue engineering, drug delivery systems. Silk fibre reinforced composites. Spidersilk and their applications: Types of spider silk, chemical compositions, general properties, tensile properties and application of spider silk			

Assessment Details (both CIE and SEE)

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Continuous Internal Evaluation:

1. Two Unit Tests each of **25 Marks**
2. Two assignments each of **25 Marks** or **one Skill Development Activity of 50 marks** to attain the COs and POs

The sum of three tests, two assignments/skill Development Activities, will be **scaled down to 50 marks**

CIE methods /question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.

Semester-End Examination:

1. The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 50.
2. The question paper will have ten full questions carrying equal marks.
3. Each full question is for 20 marks. There will be two full questions (with a maximum of four sub-questions) from each module.
4. Each full question will have a sub-question covering all the topics under a module.
5. The students will have to answer five full questions, selecting one full question from each module

Suggested Learning Resources:**Books**

1. Silk Processing, Properties and Applications- K.MurugeshBabu,WoodheadPub.Limited,UK,2013
2. Silk wet processing-Dr. M. L. Gulrajani, IIT Delhi Publication
3. SilkDyeing-Dr.V.A.Shenai, Sewak Publications
4. FAOM annual on silk.
5. SilkDyeing, Printing and Finishing– GH Hurst, Summer Press Publications

Web links and Video Lectures (e-Resources):**Skill Development Activities Suggested:**

Visit to various silk activity centres of Karnataka and study various processes used in production and characterization of silkfibres

Course outcome (Course Skill Set)

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

Sl. No.	Description	Blooms Level
CO1	Demonstrate structure, composition and properties of silk fibres	L2
CO2	Summarise world production and recent developments in post cocoon operations	L2
CO3	Illustrate production and applications of silk fibres	L3
CO4	Explain dyeing printing and finishing of silk fibres	L2
CO5	Demonstrate various unconventional applications of silk fibres and their bi-products.	L2

ADVANCED WET PROCESSING LAB			
Course Code	MJTTL207	CIE Marks	50
Teaching Hours/Week (L:T:P: S)	(0:0:4:0)	SEE Marks	50
Credits	02	Exam Hours	03
Course objectives:			
<ul style="list-style-type: none"> • Explain the functional wet processed fabric samples • Explain influence of dyes and chemicals on textiles. • Describe various modern wet processing machineries used for textile processing • Demonstrate various enzymes and softeners for finishing of fabrics • Explain the modern developments in natural dyes and their applications 			
Sl.No.	Experiments		
1	Collection and analysis of functional wet processed woven fabric samples		
2	Collection and analysis of Ink jet printed fabric samples		
3	Dyeing of cotton and silk samples with natural herbal dyes		
4	Hand painting on cotton and silk fabric samples		
5	Design and developing of screen printing on cotton and silk fabrics with multi-colour		
6	Tie and dye printing and Resist style of printing on fabrics.		
7	Finishing of fabric with enzymes		
8	Finishing of fabric with softeners		
9	Calculations and analysis of colour parameters - K/S Value, Delta value etc.		
Demonstration Experiments			
10	Demonstrate the principle and working of modern colour measurement and colour matching systems		
Course outcomes (Course Skill Set):			
At the end of the course the student will be able to:			
<ul style="list-style-type: none"> • The students will be able to tackle problems both in industry and business. • Students can collect wet processed fabric samples from testing, R & D centres, textile and apparel manufacturing industry and studying the same. • Explain the importance and necessity of modern wet processing of textiles • Inspect performance properties of fabrics and show the parameters influencing • Evaluate and demonstrate the determination of dyed and printed fabric samples 			

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 50% of the maximum marks. A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each course. The student has to secure not less than 40% of maximum marks in the semester-end examination(SEE). In total of CIE and SEE student has to secure 50% maximum marks of the course.

Continuous Internal Evaluation (CIE):

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

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

- Each experiment to be evaluated for conduction with observation sheet and record write-up. Rubrics for the evaluation of the journal/write-up for hardware/software experiments designed by the faculty who is handling the laboratory session and is 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 02 tests for 100 marks, the first test shall be conducted after the 8th week of the semester and the second test shall be conducted after the 14th week of the semester.
- In each 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 average of 02 tests is scaled down to **20 marks** (40% of the maximum marks).

The Sum of **scaled-down** marks scored in the report write-up/journal and average marks of two tests is the total CIE marks scored by the student.

Semester End Evaluation (SEE):

SEE marks for the practical course is 50 Marks.

SEE shall be conducted jointly by the two examiners of the same institute, examiners are appointed by 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 internal /external 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 10% Marks allotted to the procedure part to be made zero.

The duration of SEE is 03 hours

Suggested Learning Resources:

- Students can collect wet processed fabrics and garments from testing, R & D centres, textile and apparel manufacturing industry and studying the same.
- Practical exposure to testing of finished fabrics and related properties
- Students can visit and observe working of advanced fabric wet processing industries.
- Seminars, quizzes, group discussions and report writing on modern wet processing concepts.
- NPTEL course and lecture series: <https://nptel.ac.in/courses/>
- U Tube simulation videos, etc.
- <https://www.youtube.com/watch?v=uZN0iLLAaww>
- https://www.youtube.com/watch?v=g8_GvRoASV0
- <https://www.youtube.com/watch?v=9ND67gfwAyg>

DEVELOPMENTS IN FABRIC FORMATION			
Course Code	MJTT258A	CIE Marks	50
Teaching Hours/Week (L:P:SDA)	1:0:0	SEE Marks	50
Total Hours of Pedagogy	15	Total Marks	100
Credits	01	Exam Hours	02
Examination type (SEE)	Theory(general question paper pattern)		
Course Learning objectives:			
<ul style="list-style-type: none"> This Course aims at updating knowledge of students in fields of Shuttle less looms, multiphase looms, management of loom shed etc., 			
Module-1			
Prerequisites: Prerequisites for successful installation of shuttleless looms, yarn quality norms for unconventional weaving, preparatory process to unconventional weaving.			
Module-2			
Weft insertion methods: Weft insertion by projectile, rapier, air jet, water jet, weft insertion different weaving machines. Weft insertion by other methods by multi-phase weaving. Study of unconventional selvages, accumulators, shed geometry, weft consumption, weft unwinding tension.			
Module-3			
Multiphase weaving; flat multiphase, circulars looms. Narrow looms, Triaxial looms. Material handling equipment and its importance. Productivity- its measurement and control.			
Module-4			
Management of loom shed; Organization, Weaving plant layout, Ventilation and Humidification, Lighting. General information about maintenance. Management of loomshed, maintenance			
Module-5			
Recent development in unconventional looms; projectile, rapier, air jet, water jet, QSC wider width machine. Techno economics of unconventional weaving machines.			
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 50% of the maximum marks. Minimum passing marks in SEE is 40% of the maximum marks of SEE. A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 50% (50 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.			
Continuous Internal Evaluation:			
<ol style="list-style-type: none"> Two Unit Tests each of 25 Marks Two assignments each of 25 Marks or one Skill Development Activity of 50 marks to attain the COs and POs 			
The sum of three tests, two assignments/skill Development Activities, will be scaled down to 50 marks			
CIE methods /question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.			

Semester-End Examination:

1. The question paper will have ten questions. Each question is set for 10 marks.
2. 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).
3. The students have to answer 5 full questions, selecting one full question from each module.
4. The students have to answer 5 full questions, selecting one full question from each module. minimum of 35% of the maximum marks meant for SEE.

Suggested Learning Resources:**Textbooks**

1. Principles of Weaving-By ATC Robinson, R. Marks, 1976, Textile Institute, Manchester, London
2. Shuttle less Weaving Machine - OldrichTalavasek and Uladimin, Svaty, Elsevlin, 1981 ScientificPub. Co., New YORK
3. Modern Weaving Theory and Practice-,ISHIDA
4. Weaving, Machines, Mechanisms & Management- D.B.Ajgaonkar, Talukdar
5. Modern Preparation and weaving Machinery-A Ormerod, 1983, Butterworths London.

Web links and Video Lectures (e-Resources):

- NPTEL course on fabric formation.
- https://onlinecourses.nptel.ac.in/noc22_te06/preview

Skill Development Activities Suggested:

- Students can collect textiles effluents characteristics data's from testing, R & D centres, textile and apparel industry and studying the same.
- Seminars, quizzes, group discussions and report writing on modern textile processing concepts.
- Practical exposure to testing of textile effluent parameters- fibres, yarns and fabrics processing
- Students can visit and observe effluent treatment methods and techniques of textile processes.

Course outcome (Course Skill Set)

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

Sl. No.	Description	Blooms Level
CO1	Explain the requirements of shuttleless looms, yarn quality, weaving, and preparatory process to unconventional weaving.	L2
CO2	Explain Weft insertion stages on projectile, rapier, air jet, water jet. Weft insertion by other methods	L2
CO3	Explain Multiphase weaving, circulars looms, triaxial looms and narrow looms productivity control	L2
CO4	Summarize loom shed; Organization of loom shed, plant layout, Ventilation. And Humidification,	L2
CO5	Explain recent development in unconventional looms, QSC. Techno economics of unconventional weaving machines.	L2

BIOTECHNOLOGY APPLICATIONS IN TEXTILE INDUSTRY			
Course Code	MJTT258B	CIE Marks	50
Teaching Hours/Week (L:P:SDA)	1:0:0	SEE Marks	50
Total Hours of Pedagogy	15	Total Marks	100
Credits	01	Exam Hours	02
Examination type (SEE)	Theory(general question paper pattern)		
Course Learning objectives:			
<ul style="list-style-type: none"> Classify different types of enzymes and their industrial application. Learn genetics & biotechnology, current trends, principles of microbial, plant, animal & environmental biotechnology, safety, social, moral & ethical aspects of biotechnology. Learn the production of cellulose-free polygalacturonase, Enzymatic modification of hemp fibres, Enzyme- retted flax Combined bio scouring and bleaching of cotton fibres. Explain the effects of ultrasound on the performance of industrial enzymes Demonstrate enzymatic scouring for better textile properties of woven and knitted cotton and blended fabrics. 			
Module-1			
<p>Enzymes: Catalytic mechanism of few enzymes: Lysozyme, Chymotrypsin and serine protease, different classes of enzymes and their industrial application, application of enzymes in solution and in immobilized state, use of enzyme inhibitors as therapeutic agents.</p> <p>Biotechnology: Biotechnology-an interdisciplinary pursuit, conventional & modern biotechnology, various natural raw materials for biotechnology, genetics & biotechnology, current trends and underlying principles of microbial, plant, animal & environmental biotechnology; safety, social, moral & ethical aspects of biotechnology.</p>			
Module-2			
<p>Production of cellulose-free polygalacturonase preparation by sclerotium rolfsii for bioscouring of cotton. Enzymatic modification of hemp fibres for sustainable production of high-quality materials. Enzyme- retted flax using different formulations and processed through the USDA flax fibre pilot plant. Influence of enzymatic pre- treatment on the colours of bleached and dyed flax fibres. Combined bioscouring and bleaching of cotton fibres.</p>			
Module-3			
<p>The effects of ultrasound on the performance of industrial enzymes used in cotton bio-preparation/bio-finishing applications. Survey and recent report on enzymatic processing of bast fibres. Optimization of enzymatic scouring.</p>			
Module-4			
<p>Enzymatic scouring for better textile properties of woven and knitted cotton and blended fabrics. Recent developments in enzymatic scouring. Applications of enzymes in cotton cultivation and other types of fibre developments/productions.</p>			
Module-5			
<p>Integrated enzymatic pre-treatment of cotton fabrics. Enzymatic finishing of wool fabrics: Effects of different treatments with a protease on physical and chemical parameters of the fabric. Application of enzymes in textile effluent treatments.</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 50% of the maximum marks. Minimum passing marks in SEE is 40% of the maximum marks of SEE. A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 50% (50 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> <ol style="list-style-type: none"> 1. Two Unit Tests each of 25 Marks 2. Two assignments each of 25 Marks or one Skill Development Activity of 50 marks to attain the COs and POs <p>The sum of three tests, two assignments/skill Development Activities, will be scaled down to 50 marks CIE methods /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>The question paper will have ten questions. Each question is set for 10 marks.</p> <ul style="list-style-type: none"> • 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. • The students have to answer 5 full questions, selecting one full question from each module. minimum of 35% of the maximum marks meant for SEE.
<p>Suggested Learning Resources:</p> <p>Textbooks</p> <ol style="list-style-type: none"> 1. Biotechnology in Textile Processing, George M Guebitz, Artur Cavaco-paulo, Ryszard Kozlowski. Published by food products press, 10 Alice street, Binghamton, NY, USA. 2. Textile Processing with Enzymes, Editors: A Cavaco-Paulo G Guebitz, Woodhead Publishing, 2003 3. Bioprocessing of Textiles, C. Vigneswaran, M. Ananthasubramanian, P. Kandhavadi, Woodhead Publishing, India, 2014. 4. Advances in Textile Biotechnology, 2nd Edition, Editors: Artur Cavaco-Paulo Vincent Nierstrasz Qiang Wang, Wood head Publishing, 2019. 5. Enzymes-Biochemistry, Biotechnology & Clinical Chemistry, 2nd Edition, By Trevor Palmer and Philip L Bonner, Wood head Publishing, 2007.
<p>Web links and Video Lectures (e-Resources):</p>
<p>Skill Development Activities Suggested:</p> <ul style="list-style-type: none"> •
<p>Course outcome (Course Skill Set)</p> <p>At the end of the course the student will be able to :</p>

Sl. No.	Description	Blooms Level
C01	Demonstrate catalytic mechanism of few enzymes, different classes of enzymes and their industrial application, conventional & modern biotechnology, genetics & biotechnology, current trends, safety, social, moral & ethical aspects of biotechnology.	L2
C02	Illustrate production of cellulose-free polygalacturonase, preparation, production by different formulations and processed through the USDA flax fibre pilot plant.	L2
C03	Explain the effects of ultrasound on the performance of industrial enzymes used in cotton bio-preparation/bio-finishing applications and Optimization of enzymatic scouring.	L2
C04	Summarize Enzymatic scouring and its effects on properties of cotton and blended fabrics. Recent developments, applications	L2
C05	Demonstrate integrated enzymatic pre-treatment of cotton fabrics. Enzymatic finishing of woolfabrics, effects and Application	L2

MEDICAL TEXTILES			
Course Code	MJTT258C	CIE Marks	50
Teaching Hours/Week (L:P: SDA)	1:0:0	SEE Marks	50
Total Hours of Pedagogy	15	Total Marks	100
Credits	01	Exam Hours	02
Examination type (SEE)	Theory((general question paper pattern)		
Course Learning objectives:			
<ul style="list-style-type: none"> • Course aims at developing knowledge in various applications of textiles in medical field 			
Module-1			
Biomaterials–introduction, types; natural, polymeric and biological biomaterials			
Module-2			
Textile based healthcare and hygiene products; application of Nano technology in medical hygiene textiles; advanced textile materials in healthcare; infection control and barrier materials; plasma treated barrier materials.			
Module-3			
Bandages and pressure garments - elastic and non-elastic compression bandages, support and retention bandages; bandaging textiles; evaluation of bandages; bandages for various end uses.			
Module-4			
Wound – types, healing process; requirements of wound dressing; wound care materials – types, advantages and limitations; Testing of wound dressings; advanced wound dressings			
Module-5			
Implantable products; sutures – requirements, classifications, specifications, materials and their applications; vascular grafts, artificial ligaments, artificial tendons; scaffolds for tissue engineering; intelligent textiles for medical applications			
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 50% of the maximum marks. Minimum passing marks in SEE is 40% of the maximum marks of SEE. A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 50% (50 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.			
Continuous Internal Evaluation:			
<ol style="list-style-type: none"> 1. Two Unit Tests each of 25 Marks 2. Two assignments each of 25 Marks or one Skill Development Activity of 50 marks to attain the COs and POs 			
The sum of three tests, two assignments/skill Development Activities, will be scaled down to 50 marks CIE methods /question paper is designed to attain the different levels of Bloom’s taxonomy as per the outcome defined for the course.			
Semester-End Examination:			
<ol style="list-style-type: none"> 1. The question paper will have ten questions. Each question is set for 10 marks. 2. 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). 3. The students have to answer 5 full questions, selecting one full question from each module. 4. The students have to answer 5 full questions, selecting one full question from each module. minimum of 35% of the maximum marks meant for SEE. 			

Suggested Learning Resources**Books**

- (1) Allison Mathews and Martin Hardingham ., “Medical and Hygiene Textile Production – A hand book”, Intermediate Technology Publications,1994
- (2) Anand S.C., Kennedy J.F. Miraftab M. and Rajendran S., “Medical Textiles and Biomaterials for Healthcare”, Wood head Publishing Ltd. 2006
- (3) Joon B. Park. and Joseph D. Bronzino., “Biomaterials – Principles and Applications”,CRC Press BocaRaton London, NewYork, Washington , D.C. 2002
- (4) Anand S., “ Medical Textiles”, Textile Institute, 1996, ISBN: 185573317X
Horrocks A.R. and Anand S.C, “Technical Textiles”, Textile Institute, 1999, ISBN: 185573317

Web links and Video Lectures (e-Resources):**Skill Development Activities Suggested:**

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Course outcome (Course Skill Set)

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

Sl. No.	Description	Blooms Level
C01	Explain Biomaterials, types; natural, polymeric and biological biomaterials	L2
C02	Summarise Healthcare and hygiene products, infection control and barrier materials, plasma treated barrier materials	L2
C03	Explain Bandages and pressure garments, bandages for various end uses	L2
C04	Summarize requirements of wound dressing; wound care materials and Testing of wound dressings;	L2
C05	Implantable products; sutures artificial ligaments, artificial tendons; scaffolds for tissue engineering	L2

HUMAN RESOURCE MANAGEMENT			
Course Code	MJTT258D	CIE Marks	50
Teaching Hours/Week (L:P: SDA)	1:0:0	SEE Marks	50
Total Hours of Pedagogy	15	Total Marks	100
Credits	01	Exam Hours	02
Examination type (SEE)	Theory((general question paper pattern)		
Course Learning objectives:			
<ul style="list-style-type: none"> • Explain the Importance of job analysis and job specifications, different types of job evaluation programmes and basis of promotion, demotion, and transfers. • Demonstrate methods of training personnel for higher performance and productivity. • Explain modern methods of recruitment and selection and Industrial disputes and settlement • Describe various welfare measures, bonus facilities, wage and salary administration and incentive schemes. • Explain motivation and morale, Labour Management relations, objectives and functions of trade unions. 			
Module-1			
Introduction to human resource management with reference to objectives and policies. Functions of HRM, Scope, importance and impact on Textile Industry.			
Module-2			
Importance of job analysis and job specifications. Different types of job evaluation programmes. Basis of promotion, demotion, transfers, Methods of training personnel for higher performance and productivity. Grievance Handling – procedure for grievance handling.			
Module-3			
Modern methods of recruitment and selection. Industrial disputes, procedure for settlement of disputes.			
Module-4			
Welfare measures, bonus facilities, Wage and salary administration and incentive schemes.			
Module-5			
Motivation and Morale. Labour Management relations. Objectives and functions of trade unions. Factories act and their importance.			
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 50% of the maximum marks. Minimum passing marks in SEE is 40% of the maximum marks of SEE. A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 50% (50 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.			

<p>Continuous Internal Evaluation:</p> <ol style="list-style-type: none"> 1. Two Unit Tests each of 25 Marks 2. Two assignments each of 25 Marks or one Skill Development Activity of 50 marks <p>to attain the COs and POs</p> <p>The sum of three tests, two assignments/skill Development Activities, will be scaled down to 50 marks</p> <p>CIE methods /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> <ol style="list-style-type: none"> 1. The question paper will have ten questions. Each question is set for 10 marks. 2. 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). 3. The students have to answer 5 full questions, selecting one full question from each module. 4. The students have to answer 5 full questions, selecting one full question from each module. minimum of 35% of the maximum marks meant for SEE. 		
<p>Suggested Learning Resources</p> <p>Books</p> <ol style="list-style-type: none"> (1) Human Resource Management – P Subba Rao, Himalaya Publishing, New Delhi (2) Human Resource Management – Gary Dessler and BijuVarkkey, Prentice Hall (3) Personnel Management” - Edwin B. Flippo, McGraw-Hill, 1986 (4) Personnel Management” - Subratha Ghosh <p>Reference Books</p> <ol style="list-style-type: none"> (1) Management of Personnel in Indian Enterprises - N.N. Chatterjee, Allied Book Agency, 1978 (2) Personnel Management - Derek Torrington, Laura Hall, Prentice-Hall, 1987 		
<p>Web links and Video Lectures (e-Resources):</p> <ul style="list-style-type: none"> • NPTEL course and lecture series: https://nptel.ac.in/courses/ • You Tube simulation videos, etc. 		
<p>Skill Development Activities Suggested:</p> <ul style="list-style-type: none"> • Students can collect fibre, yarn, fabric and garment test data’s from testing, R & D centers, textile and apparel industry and studying the same. • Seminars, quizzes, group discussions and report writing on modern textile testing concepts. • Practical exposure to testing of structure and related properties of fibres, yarns and fabrics 		
<p>Course outcome (Course Skill Set)</p> <p>At the end of the course the student will be able to :</p>		
Sl. No.	Description	Blooms Level
C01	Explain the Importance of job analysis and job specifications, different types of job evaluation programmes and basis of promotion, demotion, and transfers.	L2
C02	Demonstrate methods of training personnel for higher performance and productivity.	L2
C03	Explain modern methods of recruitment and selection and Industrial disputes and settlement	L2
C04	Describe various welfare measures, bonus facilities, wage and salary administration and incentive schemes.	L2
C05	Explain motivation and morale, Labour Management relations, objectives and functions of trade unions.	L2



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