Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

Shri Vaishnav Institute of Textile Technology

Choice Based Credit System (CBCS) Scheme in the Light of NEP- 2020

Diploma in Textile Engineering (2021-2024)

SUBJECT CODE	CATEGORY	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
DTTX501	DCS	Garment Manufacturing Technology	60	20	20	30	20	3	0	2	4

Legends: L - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Educational Objectives (CEOs):

1. To provide preliminary knowledge about the Garment Manufacturing Process.
2. To impart conceptual knowledge for pattern making, cutting, stitching process, stitching machine, and fusing process.

Course Outcomes (COs)

After completion of this course, the students are expected to be able to demonstrate the following knowledge, skills, and attitudes. Student will be able to:

1. To perform manual as well as computer marker planning with proper grading.
2. To apply correct spreading and cutting method in garment manufacturing process.
3. To identify the seams & stitches and apply different types of stitches using sewing machine.
4. To apply different components to make a garment sellable.
5. To understand the fusing process and its importance in garment industry.

Syllabus

Unit I Marker Planning and Grading — 9 Hours

Marker Planning Process, marker utilization, Manual Marker Planning. Computerized Marker Planning. Introducing grading – Definition, Basic size chart, Grading methodology. Drafting of men's shirt block.

Unit II Spreading and cutting — 9 Hours

Spreading, Methods of spreading, shade sorting of cloth pieces, correct ply direction and adequate lay stability, Alignment of piles, ply tension, fabric faults elimination. Objectives of Cutting, Methods of cutting, Manual & computer controlled cutting.

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Unit III Seams and Stitches **9 Hours**

Seam-Definition, types, superimposed seam, Lapped seam, Bound seam, Flat and fell seam, French seam, decorative stitching, edge neatening. Stitch- types, Lockstitches, Chain stitches, hand stitches, Multithread chain stitches, over edge chain stitches, covering chain stitches. Sewing Machinery- different types & machine parts, Feed mechanism, thread packages.

Unit IV Components of garments **9 Hours**

Components for the construction of garments-Labels, lace, snaps etc. Garment Finishing. Garment Pressing-Means of pressing, equipments and methods. Methods of folding. Garment Packing – packing materials, packaging instructions.

Unit V Fusing **9 Hours**

Fusing Process-object, application. Types of resins, methods of applying resins. Methods of fusing, fusing equipments. Quality parameters for fusing. Garment Defects.

List of practicals (Expand it if needed):

1. To Study Garment Process flow chart.
2. To Study Pattern making and Grading process with tools.
3. To prepare the Pattern of Men's Shirt with measurement.
4. To study the Spreading process with related parameters.
5. To study the Different cutting methods for Garment.
6. To study the different parts of sewing machine with their functions.
7. To study different types of seams with their uses.
8. To study different types of stitches with their uses.
9. To study pressing & packing procedure for garment.
10. To study Fusing Process.
11. To Study different garment sewing defects with their remedies.

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DTTX501	DCS	Garment Manufacturing Technology	60	20	20	30	20	3	0	2	4

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***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Textbooks:

1. Garment Technology for Fashion Designers, Gerry Cooklin, Steven George Hayes, John McLoughlin, Dorothy Fairclough, John Wiley & Sons, 2011
2. Introduction to Clothing Manufacture, 2nd Edition, Gerry Cooklin, Steven George Hayes (Editor), John McLoughlin (Editor), Wiley – Blackwell Publishers, 2006
3. Carr and Latham's Technology of Clothing Manufacture, 4th Edition, David J. Tyler (Editor), Wiley – Blackwell Publishers, 2008

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DTTX502	DCS	Textile Printing	60	20	20	30	20	3	0	2	4

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
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Course Educational Objectives (CEOs):

1. To provide the preliminary knowledge about textile printing process.
2. To impart conceptual knowledge on different methods and styles of printing.
3. To demonstrate various principles and mechanisms of printing processes.

Course Outcomes (COs):

After completion of this course, the students are expected to be able to demonstrate the following knowledge, skills, and attitudes. Student will be able to:

1. To understand the value addition through printing process and history of printing.
2. To describe different methods of printing and styles of printing.
3. To select various ingredients for printing and prepare printing paste from various compatible chemicals and dyes.
4. Pretreatment and post-treatment required for quality printing and print on various types of textiles by using suitable dyes and chemicals.

Syllabus

Unit I Introduction to printing — 7 Hours

Introduction and objectives of printing, Similarity and difference between dyeing and printing, printing and value addition, difficulties faced in printing, History and evolution of printing, Importance of printing.

Unit II Different methods and styles of printing — 11 Hours

Different traditional methods of printing: Block printing, Manual Screen Printing, Automatic Flat Bed screen printing, Rotary Screen printing, Transfer printing; Different styles of printing: Direct, discharge and resist style.

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DTTX502	DCS	Textile Printing	60	20	20	30	20	3	0	2	4

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Unit III Printing ingredients — 11 Hours

Dyes: Direct dye, Reactive dye, vat dye, azoic dye, acid dye, disperse dye; pigments: Different types of pigments, Role of Catalyst and Crosslinking agents; Thickeners: Starch, Gum, Sodium alginate, Emulsion thickener; Auxiliaries in printing paste.

Unit IV Pretreatment processes — 9 Hours

Importance of pretreatment for printing, various pretreatment processes like singeing, desizing, scouring, bleaching, degumming of silk, heat setting; machines used in pretreatment processes.

Unit V After treatment processes — 7 Hours

Importance of aftertreatment processes; Fixation using steaming and curing, continuous steaming, saturated and superheated steam, Festoon steamer, curing.

List of practicals (Expand it if needed):

1. Scouring of cotton fabric sample using Sodium Hydroxide.
2. Bleaching of cotton fabric sample using Hydrogen Peroxide.
3. Printing of cotton fabric using reactive dye by block printing method.
4. Printing of P/C Blended fabric using pigment by screen printing method.
5. Printing of cotton fabric using resist style (Tie and dye).
6. Printing of silk fabric using acid dye by block printing method.
7. Printing of polyester fabric using pigment by screen printing method.
8. To study and observe construction and working of flat bed screen printing machine.
9. To study and observe the construction and working of rotary screen printing machine.
10. To study and observe construction and working of stenter.

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DTTX502	DCS	Textile Printing	60	20	20	30	20	3	0	2	4

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Textbooks:

1. Textile Printing, Leslie W.C. Miles, Society of Dyers and Colourists, UK, 2003
2. Technology of Textile Printing, R.S. Prayag, Shree J Printers, 1999
3. Technology of Printing, V A Shenai, N M Saraf, Sevak Publications, Bombay, 1998

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COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
DTTX503	DCC	Fabric and Garment Testing	60	20	20	30	20	3	0	2	4

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Educational Objectives (CEOs):

1. Students will able to know identify various fabric structure and structural parameters.
2. Student will able to know various tensile testing principle.
3. Student will accurately assess and test the fabric properties (functional and aesthetic) according to their application & requirement.

Course Outcomes (COs):

After completion of this course, the students are expected to be able to demonstrate the following knowledge, skills, and attitudes. Student will be able to

1. Classify the fabric as per its structure.
2. Understand different physical parameters of fabrics.
3. Describe tensile properties and its principle for fabric testing.
4. Demonstrate methods to evaluate fabric aesthetic properties.

Syllabus

Unit I Introduction **9 HOURS**

Classification of Fabric on basis of its structure, Cloth structure analysis on the basis of it's design such as woven fabric, knitted fabric, braided fabric and Nonwoven fabric.

Unit II Physical parameters of Fabric **09 HOURS**

Ends per inch, Picks per inch in woven fabric, yarn count and crimp of warp and weft, fabric weight per unit length, Fabric weight per unit area fabric thickness measurement, Fabric width, Course per inch and wales per inch in knitted fabric, etc.

Unit III Tensile Properties **8 HOURS**

Terms and definition related to fabric tensile testing, various tensile testing principle (CRL, CRE and CRT). Gauge length difference between Fabric grab and strip tensile test. Load-elongation curve and its conversion to stress-strain curve.

Unit IV Application related properties of fabric **9 HOURS**

Bursting test, air permeability, water permeability, water-proofing, tearing strength, shrinkage, color fastness tests, washing fastness, rubbing fastness, sublimation fastness, perspirations fastness, dry cleaning, flammability test and its assessment.

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DTTX503	DCC	Fabric and Garment Testing	60	20	20	30	20	3	0	2	4

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
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Unit V Aesthetic Properties **9 HOURS**

Aesthetic fabric properties e.g. drape, handle, stiffness, crease recovery pilling, wear and abrasion resistance of fabric which hamper aesthetic appearance of fabric.

Text Books:

1. Physical Testing of Textiles by B. P. Saville, revised edition (2016), Woodhead Publishing Ltd., U. K.
2. Principles of Textile Testing by J. E. Booth, revised edition (2011), Heywood Books, London.
3. Handbook of Textile Testing and Quality Control, E. B. Grover and D. S. Hamby. A

List of Experiments:

1. To Study and analysis of woven fabric EPI and PPI
2. To Study and analyse warp and weft yarn count and crimp % in woven fabric sample.
3. To study and analyse course/inch and wales/inch in knitted fabric sample.
4. To estimate grams per square meter (GSM) of a given fabric sample.
5. To estimate Fabric tensile strength by using fabric tensile tester (Strip method).
6. To study and test fabric tearing strength for woven fabric
7. To estimate bursting strength of woven/knitted fabric sample.
8. To Study and analyse woven fabric stiffness properties.
9. To analyse pilling tendency of a knitted fabric.
10. To analyse abrasion resistance properties of woven fabric sample.
11. To analyse colour fastness properties of dyed garment fabric sample.
12. To analyse washing fastness of fabric sample taken from garment.

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DTTX504	DCS	CAD in Textile					50	0	0	2	1

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Educational Objectives (CEOs):

1. To provide knowledge about the preliminary functions of Computer Aided Designing (CAD) in Textile.
2. To demonstrate method of designingand fabric simulationusing CAD software.
3. To enhance skill in the field oftextile designing using CAD software.

Course Outcomes (COs):

After completion of this course the students are expected to be able to demonstrate the following knowledge, skills, and attitudes. Student will be able to

1. Understand the installation and hardware requirements for CAD software.
2. Use different commands to produce fabric simulation using CAD software.
3. Prepare different types of Dobby, Jacquard and Printed Fabric design using CAD software.

List of Practical (Expand it if needed):

1. To study woven design structure.
2. To study application, uses& features of CAD in Textile.
3. To study installation &hardware requirement for CAD software.
4. To Study dobby CAD software with various menu commands.
5. To prepare design on Dobby CAD software with proper parameters and color effects.
6. To manage dobby design library on CAD with plain and twill weave.
7. To study Jacquard CAD software with various menu commands.
8. To draw figured pattern on graph paper and apply to Jacquard CAD software.
9. To study Printex CAD software with various menu commands.
10. To draw figured pattern on Printex CAD software.
11. To study Vector tool in Printex CAD software.

Textbooks:

1. Fabric Structure & Design, N. Gokarneshnan,New Age International Publishers, 2004
2. CAD/CAM Principles and applications –P.N.Rao,McGraw Hill Education Publishers, 2010
3. CAD Dobby, Jacquard and Printex Software Manuals by Teckmen System

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DTTX515	DSE	TECHNICAL TEXTILES	60	20	20	-	-	3	0	0	3

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Educational Objectives (CEOs):

1. To provide knowledge about technical textiles along with technical fibers, technical yarns, and technical fabrics.
2. To provide knowledge about the application of technical textiles in filtration, geotextiles, medical textiles, etc.

Course Outcomes (COs):

After completion of this course, the students are expected to be able to demonstrate the following knowledge, skills, and attitudes. The students will be able.

1. To tell the requirement of technical textiles products.
2. To classify the technical textile products based on raw materials, processes, and applications.
3. To understand the role of new technical fibers, technical yarns, and technical fabrics in the applications of technical textile products.
4. To describe different methods of technical yarns and technical fabric formation, especially nonwoven fabric.
5. To explain the use of technical textile products in different application areas.

Syllabus

Unit-I Technical Textiles Overview **8 HOURS**

Definition, Classification based on raw material, process and application area, Market overview, Application areas of technical textiles, Future scope to technical textile industry.

Unit-II High-Performance Fiber **9 HOURS**

Conventional fibers, high-performance fibers overview, properties, requirement, classification; applications and properties of carbon, Aramid, Basalt, HDPE, Glass, PTFE, Ceramics, etc.

Unit-III Technical Yarns **9 HOURS**

Requirements and applications of technical yarns, Types of technical yarns, their properties and applications, Modification of textile yarn structures for functional applications, Different Yarn formation methods, Hybrid yarns, and technical sewing threads.

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DTTX515	DSE	TECHNICAL TEXTILES	60	20	20	-	-	3	0	0	3

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Unit-IV Technical Fabric Structure **9 HOURS**

Warp Knitted, Nonwoven Fabrics, Nonwoven fabric production, Different web laying methods of nonwoven, different bonding methods of nonwoven, Application of nonwoven fabrics in technical textiles.

Unit-V Applications of Technical Textiles **10 HOURS**

Agro textiles, Filtration, Composite, Geotextiles, Medical Textiles, Automobiles, Protection, Sports, Environmental Protection, Packaging, Home textiles, etc.

Textbooks:

1. Handbook of Technical Textiles, Edited by A. R. Horrocks and S. C. Anand, CRC Press, 2000.
2. Handbook of Nnonwovens, Edited by S. J. Russell, Woodhead Publishing Limited, 2007.
3. Technical Textile Yarns, Edited by R. Alagirusamy and A. Das, Woodhead Publishing Limited, 2010.

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DTTX525	DSE	Nonwoven Technology	60	20	20	0	0	3	0	0	3

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; C - Credit.
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Educational Objectives (CEOs):

1. Impart basic knowledge about the principle of manufacturing of nonwoven materials to the extent of their technical use.
2. Demonstrate various steps involved in nonwoven fabric manufacturing.

Course Outcomes (COs):

After completion of this course the students are expected to be able to demonstrate the following knowledge, skills, and attitudes. The students will be able to

1. Understand the importance of nonwoven textile materials.
2. Understand the manufacturing process of nonwoven fabrics.
3. Interpret about the various web formation techniques and bonding process.

Syllabus

UNIT I: Introduction to nonwovens **10 HRS**

Definition of nonwoven fabric, general properties of nonwoven fabrics, particulars on which properties of nonwoven fabric depends, different fibrous matter used to manufacture nonwoven bonded fabric, fiber description considerations.

UNIT II: Properties and Classification **9 HRS**

Properties of nonwoven fabric produced using different fibrous matter. Classification and areas of application of nonwoven fabrics, Bonding agent used in nonwovens; properties desired in bonding agent.

UNIT III: Production steps for nonwoven fabric: **8 HRS**

General production steps for nonwoven fabric manufacturing. Dry bonded fabric production steps spun bonded fabric production steps, wet bonded fabric production steps.

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			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
DTTX525	DSE	Nonwoven Technology	60	20	20	0	0	3	0	0	3

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; C - Credit.
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Unit-IV: Web Formation Techniques **9 HRS**

Processes of web formation. Types of webs and their forming techniques, staple fibre web – dry-laid web: parallel laid web and their advantages and disadvantages, cross laid web and their advantages and disadvantages and random laid web and their advantages and disadvantages

UNIT V: Bonding process: **9 HRS**

Mechanical bonding processes - needle punching technology, Thermal bonding processes – hot calendaring method and adhesive and chemical bonding processes.

Textbooks:

1. Handbook of Non-wovens by Stephen Russell, Woodhead Publishing Ltd., UK, 2007
2. Albrecht W, Fuchs H & Kittelmann, "Nonwoven Fabrics", Wiley-VCH Weinheim, 2003.
3. Mrstina V & Fejgal F, "Needle punching textile technology", Elsevier, 1990.

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Shri Vaishnav Institute of Textile Technology
Choice Based Credit System (CBCS) Scheme in the Light of NEP- 2020
Diploma in Textile Engineering (2021-2024)

SUBJECT CODE	CATEGORY	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
DTTX535	DSE	Textile Mill Planning and Management	60	20	20	-	-	3	0	0	3

Legends: L - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
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Course Educational Objectives (CEOs):

1. Demonstrate the preliminary requirements for starting a textile plant and project management.
2. Build conceptual knowledge on the different types of pollution and their control in textile industries.
3. Demonstrate correct reasons of various problems and their solution in a textile industry.

Course Outcomes (COs)

After completion of this course, the students are expected to be able to demonstrate the following knowledge, skills, and attitudes. Student will be able to:

1. Analyse various factors for setting up of a textile industry.
2. Calculate production and use it in balancing of machineries in textile industries.
3. Understand the concept of plant and machine layout.
4. Understand the importance and concept of controlling humidity and temperature in a textile plant.
5. Use their conceptual knowledge on pollution control in textile industries.

Unit I Site selection and erection of textile industry — 9 Hours

Selection of site for textile mills. Textile mill building structures. Principles and requirements of good foundation for machineries. Protection against noise and vibration. Erection of textile machinery. Idea and comparison of preventive and breakdown maintenance

Unit II Spinning and weaving Plan — 10 Hours

Spin plans for various counts of yarns. Production rates, waste, efficiency level of spinning machines. Estimation of number of machines for production of yarn. Production and efficiency of preparatory and loom shed. Estimation of number of machines in preparatory and weaving.

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Unit III Plant and machine layout **8 Hours**

Plant lay-out and machine lay-out. Labor allocation in different departments of a textile mill. Work study and work measurement. Application of time study in a textile mill. Importance and use of snap study. Concept and application of logistics in a textile mills.

Unit IV Air Conditioning and Humidification **8 Hours**

Air conditioning, humidification, and ventilation for a textile mill - different systems of humidification and their efficiency. Temperature, relative humidity, and ventilation requirement for different sections of a textile mill.

Unit V Dust extraction and Pollution control in textile mills **10 Hours**

Importance Dust extraction in textile mills - methods and equipment used in dust extraction. Air pollution and water pollution caused by textile industry, Various methods of reduction of pollution in textile mills: Filter, Electrostatic precipitators.

Textbooks:

1. Industrial Engineering & Management by S.C. Sharma and T.R. Banga, Khanna Book Publishing Co. Ltd, 2020.
2. Textile Manufacturing Processes by M. G. Kulkarni, IntechOpen Publishers, 2019.
3. Management of Textile Industry by V.D. Dudeja, Textile Trade Press, 1981.

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