



# Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

## ML307 ENVIRONMENTAL MANAGEMENT AND SUSTAINABILITY

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*				
ML-307	Compulsory	Environmental Management and Sustainability	60	20	20	0	0	4	0	0	4

**Legends:** L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit;

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

### Course Objectives

1. To create awareness towards various environmental problems.
2. To create awareness among students towards issues of sustainable development.
3. To expose students towards environment friendly practices of organizations.
4. To sensitize students to act responsibly towards environment.

### Examination Scheme

The internal assessment of the students' performance will be done out of 40 Marks. The semester Examination will be worth 60 Marks. The question paper and semester exam will consist of two sections A and B. Section A will carry 36 Marks and consist of five questions, out of which student will be required to attempt any three questions. Section B will comprise of one or more cases / problems worth 24 marks.

### Course Outcomes

1. The course will give students an overview of various environmental concerns and practical challenges in environmental management and sustainability.
2. Emphasis is given to make students practice environment friendly behavior in day-to-day activities.



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## COURSE CONTENT

### Unit I: Introduction to Environment Pollution and Control

1. Pollution and its types (Air, Water, and Soil): Causes, Effects and Control measures
2. Municipal Solid Waste: Definition, Composition, Effects
3. Electronic Waste: Definition, Composition, Effects
4. Plastic Pollution: Causes, Effects and Control Measures

### Unit II: Climate Change and Environmental Challenges

1. Global Warming and Green House Effect
2. Depletion of the Ozone Layer
3. Acid Rain
4. Nuclear Hazards

### Unit III: Environmental Management and Sustainable Development

1. Environmental Management and Sustainable Development: An overview
2. Sustainable Development Goals (17 SDGs)
3. Significance of Sustainable Development
4. Environment Friendly Practices At Workplace and Home (Three Rs' of Waste Management, Water Conservation, Energy Conservation)

### Unit IV: Environmental Acts

1. The Water (Prevention and Control of Pollution) Act, 1974: Objectives, Definition of Pollution under this act, Powers and Functions of Boards
2. The Air (Prevention and Control of Pollution) Act, 1981: Objectives, Definition of Pollution under this act, Powers and Functions of Boards
3. The Environment (Protection) Act, 1986: Objectives, Definition of important terms used in this Act, Details about the act.
4. Environmental Impact Assessment: Concept and Benefits

### Unit V: Role of Individuals, Corporate and Society

1. Environmental Values
2. Positive and Adverse Impact of Technological Developments on Society and Environment
3. Role of an individual/ Corporate/ Society in environmental conservation
4. Case Studies: The Bhopal Gas Tragedy, New Delhi's Air Pollution, Arsenic Pollution in Ground Water (West Bengal), Narmada Valley Project, Cauvery Water Dispute, Fukushima Daiichi Disaster (Japan), Ozone Hole over Antarctica, Ganga Pollution, Deterioration of Taj Mahal, Uttarakhand flash floods



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### Suggested Readings:

1. Rogers, P.P., Jalal, K.F. , Boyd, J.A.(Latest Edition) . **An Introduction to Sustainable Development.** Earthscan
2. Kalam, A.P.J. (Latest Edition) . **Target 3 Billion: Innovative Solutions Towards Sustainable Development.** Penguin Books
3. Kaushik , A. and Kaushik (Latest Edition). **Perspectives in Environmental Studies.** New Delhi: New Age International Publishers.
4. Dhameja, S.K. (Latest Edition). **Environmental Studies.** S.K. Kataria and Sons.New Delhi
5. Bharucha, E. (Latest Edition). **Environmental Studies for Undergraduate Courses.** New Delhi: University Grants Commission.
6. Wright, R. T. (Latest Edition). **Environmental Science: towards a sustainable future .**New Delhi: PHL Learning Private Ltd.
7. Rajagopalan, R. (Latest Edition). **Environmental Studies.** New York: Oxford University Press.



## Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

### Shri Vaishnav Institute of Textile Technology Choice Based Credit System (CBCS) in Light of NEP-2020 B. Tech. in Textile Engineering (168 Credit 2023-2027)

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*				
BTTX 301	DCC	FIBRE SCIENCE I	60	20	20	0	0	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 the knowledge of principle and manufacturing process of natural and manmade fibre.
2. To impart the knowledge of various properties of different natural and manmade fibre.
3. To expose the knowledge of structural properties of fibre.

#### Course Outcomes (COs):

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

The students will be able to

1. Explain the knowledge of fiber forming polymers and methods of polymerization.
2. Explain the structure of natural and manmade fibers.
3. Understand basic fiber characterization techniques.
4. Demonstrate their knowledge of various fibres and their properties and evaluate the properties of different natural and manmade fibre accurately.
5. Explain the manufacturing process of synthetic fiber.

### Syllabus

#### Unit I Introduction to Polymers


9 h

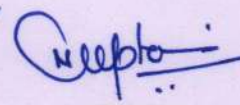
Basic concept of polymer, their classification, methods of polymerization, molecular weight and its measurement, distribution and importance.

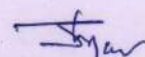
#### Unit II Introduction to Fibres

9 h

Structure of Fibres: basic requirements for fibres formation, concept of order and morphology,

  
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molecular packing in crystalline and amorphous regions, physical structure of principal natural and manmade fibres.

#### Unit-III Fibre Characterization Techniques

9h

Study of fiber structures & methods of investigating fiber structures e.g. X-ray diffraction, optical and electron microscopy, I R absorption, thermal methods NMR.

#### Unit-IV Introduction to natural Fibres

9h

General classification of fibres. Structure, properties and uses of cotton fibre. Structure, properties and uses of bast fibers, structure, properties, uses and brief description of wool and silk fibres.

#### Unit-V Manufacturing of Synthetic Fibres

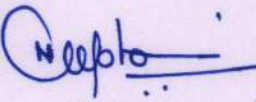
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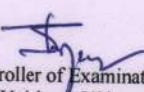
Manufacturing process of all important man-made fibres e.g. rayon, nylon, polyester, acrylic, polyolephins etc. with special reference to melt, dry and wet extrusion principle. Idea about the physical and chemical properties (influence of chemical constituents and different groups present) of above mentioned fibres and their uses. Problems associated with man-made fibres and their methods of rectification.

#### List of Experiments:

1. Identification of Natural fibres by optical microscope for longitudinal view: Cotton, Jute, Wool, Silk.
2. Identification of Synthetic fibres by optical microscope for longitudinal view: Viscose, Polyester, Nylon.

  
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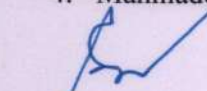
3. Identification of Natural fibres by optical microscope for cross sectional view: Cotton, Jute, Wool, Silk.
4. Identification of Synthetic fibres by optical microscope for cross sectional view: Viscose, Polyester, Nylon.
5. Identification of Natural fibres by burning test: Cotton, Jute, Wool, Silk.
6. Identification of Synthetic fibres by burning test: Viscose, Polyester, Nylon.
7. Identification of Natural fibres by chemical test: Cotton, Jute, Wool, Silk.
8. Identification of Synthetic fibres by chemical test: Viscose, Polyester, Nylon.
9. Identification of Natural fibre blend components from yarn.
10. Identification of Synthetic fibre blend components from yarn.

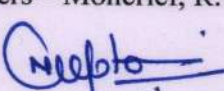
#### Text Books:

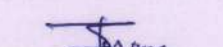
1. Manufactured Fibre Technology, Gupta, V.B., Kothari, V.K., Springer, 1997.
2. Textile Science: An Explanation of Fibre Properties, Gohl, E. P. G., Vilensky, L. D., CBS Publisher, 1984.
3. Handbook of Textile Fibre Structure, Eichhorn, S., Hearle, J. W.S., Kikutani, T., Jaffe. M., ELSEVIER, Vol. 1, 2009.

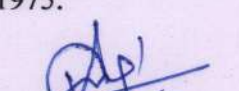
#### References:

1. The Chemistry of Textile Fibres, Mather, R. R., Wardman, R. H., Royal Society of Chemistry, 2015.
2. Production of Synthetic Fibres – Vaidya, A. A., Prentice Hall of India, Private Limited, New Delhi, 1998.
3. Manmade Fibres - Their origin and development, Seymour, R.B., Porter, R.S., Springer Dordrecht, XII, 1993.
4. Manmade Fibers – Moncrief, R.W., Halstead Press, New York, 1975.

  
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BTTX 302	DCC	YARN MANUFACTURING I	60	20	20	30	20	3	0	2	4

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#### Course Educational Objectives (CEOs):

1. To understand the processing of textile fibres on Blow Room and Card.
2. To investigate the reasons of various problems and their solution in Blow Room and Card.

#### 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. Explain yarn production stages and importance of ginning in cotton yarn production.
2. Explain cotton fiber processing in blow room and its importance in yarn production.
3. Explain cotton fiber processing in carding and its importance in yarn production.
4. Understand manmade fiber processing in blow room, carding, and concept of blending.
5. Apply their knowledge for setting of machine parameters for various textile fibers and also able analyse the problem of various faults occurring in blow room and carding.

## Syllabus

### Unit I: Ginning

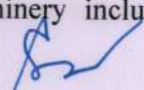
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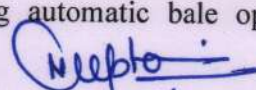
Characteristic of cotton fiber, Ginning of cotton fibers, Different types of ginning, roller ginning, saw ginning, Importance of the ginning to eliminate the contamination in the yarn, The scenario of Indian ginning industries.

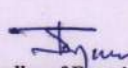
### Unit II: Blow Room

10 h

Objects of blow room, Principles of opening, cleaning, and blending, Preparation of uniform lap, Principal of blow room machines and blow room lines, Recent developments in blow room machinery including automatic bale openers, blenders, chute feed systems, optical color

  
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BTTX 302	DCC	YARN MANUFACTURING I	60	20	20	30	20	3	0	2	4

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material detectors, dust removal etc., Assessment of blow room performance, Calculation of blow room production.

#### Unit III: Carding

10 h

Object of carding, Principles of working, Construction and working of different parts of the card, Type of card clothing, Concept of chute feed, Factors influencing the design of carding machines, Elements, and effect of their speed on carding performance. Assessment of card performance, Production calculation, Waste % and draft etc. Concept of coiling.

#### Unit IV: Manmade Fiber Processing

9 h

Characteristics of manmade fibres, Object of blending, Types of blending, Processing, and difficulties of manmade fibres in blow room and carding, Idea of fibre distribution in yarns, factors affecting the blend irregularity, Blend calculation.

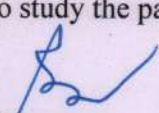
#### Unit V: General Process Parameters and Maintenance

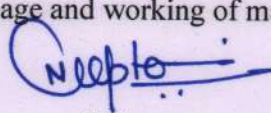
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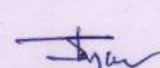
Environmental condition for various fibers in blow room and carding, Process parameters of different machines for different materials, General idea of speed, setting and their impact on both natural and manmade fibre processing, General idea of defects and remedies in blow room and carding, Maintenance schedule and important supervisory check points at blow room and carding.

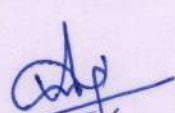
#### List of Experiments (Expand it if needed):

1. Demonstration of spinning machines for conversion of Fiber into Yarn.
2. To study the passage and working of material through Mixing Bale Opener.
3. To study the gearing system of Mixing Bale Opener and its production/shift.
4. To study the passage and working of material through Hopper Feeder.

  
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5. To study the gearing system of Hopper Feeder and its production/shift.
6. To study the passage and working of material through Two Blade Beater.
7. To study the gearing system of Two Blade Beater and its production/shift.
8. To study the passage and working of material through Lap Forming Unit.
9. To study the gearing system of Lap Forming Unit and its production/shift.
10. To study the passage and working of material through Carding Machine.
11. To study the gearing system of Carding Machine and its production/shift.

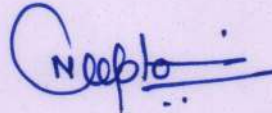
#### Textbooks:

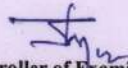
1. Processing of Manmade and Blends on Cotton System, 3<sup>rd</sup> Edition, K R Salhotra, Textile Association (India), 2004.
2. The Rieter Manual of Spinning, Vol. I, W. Klein, Rieter Machine Works Ltd. 2016.
3. The Rieter Manual of Spinning, Vol. II, W. Klein, Rieter Machine Works Ltd. 2016.

#### References:

1. A Practical Guide to Quality Management in Spinning, B. Purushothama, Woodhead Publishing India, 2011.
2. Process Management in Spinning, R. Senthil Kumar, CRC Press, 2015.
3. Handbook on Cotton Spinning Industry, B. Purushothama, Woodhead Publishing India, 2016.
4. Principles of Spinning: Fibres and Blow Room Cotton Processing in Spinning, A R Khare, CRC Press, 2021.
5. Principles of Spinning: Carding and Draw frame in Spinning, A R Khare, CRC Press, 2022.

  
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#### Course Educational Objectives (CEOs):

1. To describe the working principles of different winding, warping, and drawing in process
2. To correctly describe the working principles of sizing m/c.
3. To identify and prepare size paste recipes for natural and synthetic yarns.

#### 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. Describe the working principles of different winding m/c and prepare cone or cheese as per the required quality and specifications.
2. Describe the working principles of different warping m/c and prepare warp beam as per the required quality and specifications.
3. Identify and will prepare size paste recipes for natural and synthetic yarns correctly.
4. Describe the drawing in process.

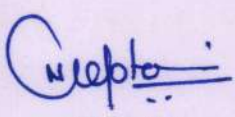
## Syllabus

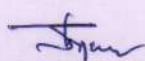
### Unit I: Winding:

9HRS

Object of Winding, classification of winding machines. Passage of yarn through cone winding machines. tensioning devices, yarn clearers, yarn traversing devices, yarn stop Motion, ribbon formation causes and method of its elimination. Passage of yarn through high-speed automatic winding machines. Different features of Automatic high-speed winding machines, splicing-mechanism and advantages.

  
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BTTX303	DCC	FABRIC MANUFACTURING -I	60	20	20	30	20	3	0	2	4

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#### Unit II: Pirn winding:

9HRS

Weft winding - different types, passage of yarn through pirn winding machine, features of automatic pirn winding machine, bunching, package diameter, winding and binding coil ratio, calculation related to winding production and efficiency.

#### Unit-III Warping:

9HRS

Object of warping, classification of warping machines beam warping and sectional warping machine Warping measuring motion, stop motions, creel types and features, Features of modern high speed warping machines.

#### Unit-IV: Sizing:

9HRS

Objects of sizing, types of size preparation, passage of warp through slasher sizing and multicylinder sizing machines, various types of size ingredients used in size paste and their functions, detailed study of size box, detailed study of various drying systems – two cylinder, multi cylinder and air-drying system, measuring and self-stopping motion.


#### Unit-V: Drawing-in:

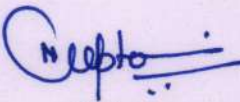
9HRS

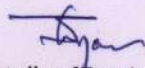
Manual Drawing-in, semi – automatic and automatic drawing in machine, twisting and looming (knotting and gaiting), Calculations related to production and efficiency of warping process.

#### List of Experiments (Expand it if needed):

1. Study of the construction and working of winding machine and function of various parts of it.

  
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### Shri Vaishnav Institute of Textile Technology Choice Based Credit System (CBCS) in Light of NEP-2020 B. Tech. in Textile Engineering (168 Credit 2023-2027)

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2. Setting of winding machine component for producing packages of suitable dimension and calculation to winding production.
3. Pirn winding machine – construction and it's working and calculation to Pirn winding production.
4. Setting of pirn winding m/c for manufacturing of various pirn with diameter, bunch length and traverse length.
5. Study of various types of packages for dimension and their specialties (including cone angle, winding angle, coil per traverse, density, winding, and binding coil. Etc.).
6. Study and practice weaver's knot and fisherman's knot.
7. Study of working of Beam warping machine and calculation of warping production.
8. Study of the working of Sectional warping machine.
9. Study and observation of the working of sizing machine.
10. Study and observation of the working of Drawing in process.

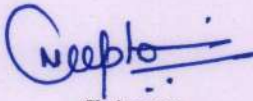
#### Textbooks:

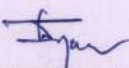
1. An introduction to winding & warping by M.K. Talukdar, Mahajan Publishers Pvt Ltd, 2003.
2. Textile sizing by Bhuvnesh C. Goswami, Rajesh D. Anandjiwala, David Hall, CRC Press, 2004.
3. Yarn preparation by R. Sengupta, Popular Prakashan, 2nd edition, 2006

#### References:

1. Handbook of weaving preparation by D. S. Verma, Allahabad: Kitab Mahal, 1967.

  
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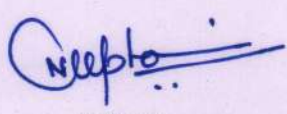
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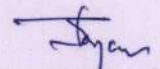
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2. Modern Preparation and Weaving Machinery by A. Ormerod, Butterworth-Heinemann, new edition, 2004.
3. Winding – Silver Jubilee Monograph by Bombay Textile Research Association, publisher S.M. Betrabet, 1983.
4. Warping and sizing – Silver Jubilee Monograph by Bombay Textile Research Association, publisher S.M. Betrabet, 1981.
5. Sizing- Materials, Methods and Machines by M.K. Talukdar, D.B Ajgaonkar and Wadekar, Textile Trade Press ,Bombay,1982.

  
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BTTX304	DCC	FABRIC STRUCTURE AND DESIGN I	60	20	20	30	20	3	0	2	4

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### Course Educational Objectives (CEOs):

1. To understand and design basic fabric structures (like plain, twill and satin structures as per specifications).
2. To identify and differentiate different derivatives of basic weaves and their effect in fabric.

### Course Outcomes (COs)

Student will be able to:

1. Understand the elements of woven fabric designs and able to develop plain weave design and its derivatives.
2. Design twill weaves and their derivatives on graph paper.
3. Design different fancy weaves with their draft and peg plan on graph paper.
4. Explain the effect of yarn twist direction and twill angle effect.
5. Describe the color and weave effect and develop new woven fabric design, provide suitable draft and peg plan for a given weave, and solve technical problems related to basic fabric structures on the loom.

## Syllabus

### Unit I Elements of Woven Design

9 hrs

General principles of fabric structure and design. Fabric classification, Weave notation and weave repeat, Introduction to design, drafting and peg-plan systems and their relationship, Plain weave and its derivatives e.g. warp rib, weft rib and hopsack/ matt.

### Unit II Twill Weave and its derivatives

9 hrs

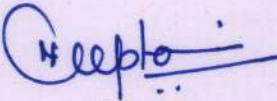
Twill weave its different types and derivatives e.g., pointed, curved, broken, elongated, transposed, fancy and cork-screw, Satin and sateen weave regular and irregular.

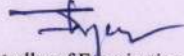
### Unit III Fancy Weaves

9 hrs

Diamond, Honeycomb ordinary honeycomb and brighton honeycomb, Mockleno, Huck- aback, crepe weave, distinct types of bed ford cord, welt and pique.

  
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### Unit IV Twill angle and its effect

9 hrs

Twill angle and yarn twist angle, Effect of yarn twist direction on the prominence of twillines in the fabric, Reed and heald count systems and related calculations.

### Unit V Effect of colour

9 hrs

Color and weave effects: stripes and checks, Bird's eyes effect, Hound tooth effect, hairline effect.

### List of Practical (Expand it if needed):

1. To study the design, draft and peg-plan of Plain weave.
2. To study the design, draft and peg-plan of Satin and sateen weave.
3. To study the design, draft and peg-plan of honeycomb.
4. To study the design, draft and peg-plan of Brighton honeycomb.
5. To study the design, draft and peg-plan of bed ford cord.
6. To study the design, draft and peg-plan of welt and pique.
7. To study the design, draft and peg-plan of twill.
8. To study the colour and weave effects for strip weave.
9. To study the colour and weave effects for check weave.
10. To study the reed and heald count systems and related calculations.

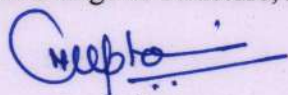
### Text Book

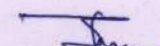
1. Fabric Structure and Design, N. Gokarneshan, Generic publication, 2011.
2. Design and Structure of Textile Fabric, S. P. Mishra, Woodhead Publishing India, 2020.
3. Fabric Structure-Simplified, Priyank Goyal, Kindle Edition, 2014.


### References:

1. Woven cloth construction, A. T. C. Robinson and R. Marks Robinson, Springer New York, 2014.
2. Watson's Textile Design and Colour, Elementary Weaves and Figured Fabrics, Z.J Grosicki, Woodhead Publisher, 2014.
3. Textile Weaving & Design, Murphy W S, Abhishek Publications, 2007.
4. Woven Fabric Design & Structure, A G Temesgen, Ö F Tursucular. Lambert Academic

  
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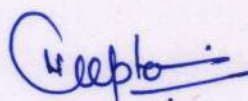
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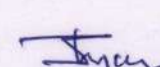
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Publishing, 2019.

5. Fabric Structure and Design, Darshan Chaturvedi , Random Publication, 2014.

  
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