DKTE Society's
TEXTILE & ENGINEERING INSTITUTE

Rajwada, Ichalkaranji 416115

(An Autonomous Institute)

DEPARTMENT: TEXTILES

CURRICULUM

B. Tech. Fashion Technology Program

Second Year

With Effect From

2021-2022

Second Year B. Tech Fashion Technology
Semester- III

Sr. No.	Course Code	Name of the Course	Group	Teaching Scheme				Credits
				Theory Hrs/ Week	Tutorial Hrs/ Week	Practical Hrs/ Week	Total	
1	TFL231	Textile Mathematics - III	BSC	3			3	3
2	TFL232	Fashion Illustration	ESC	3			3	3
3	TFL233	Fabric Structure and Design	PCC	3			3	3
4	TFL234	Fibre and Yarn Testing	PCC	3			3	3
5	TFL235	Textile Manufacturing - III	PCC	3			3	3
6	TFL236	Pattern Engineering - I	PCC	3			3	3
7	TFP237	Fashion Illustration Lab	ESC			2	2	1
8	TFP238	Fabric Structure and Design Lab	PCC			2	2	1
9	TFP239	Fibre and Yarn Testing Lab	PCC			2	2	1
10	TFP240	Pattern Engineering - I Lab	PCC			2	2	1
11	TFP241	Digital Fashion Illustration	ESC			2	2	1
12	ADL201-A	Environmental Studies	MC	2			2	--
		Total		**20**	**0**	**10**	**30**	**23**

Group Details

HSMC: Humanities, Social Science & Management Courses

BSC: Basic Science Courses

ESC: Engineering Science Courses

PCC: Professional Core Courses

PEC: Professional Electives Courses

OEC: Open Elective Courses

PST: Project / Seminar / Ind. Training

MC: Mandatory Courses

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Second Year B. Tech. Fashion Technology (Semester – III)		
TFL231: TEXTILE MATHEMATIC-III		
Teaching Scheme: Lectures: 03 Hrs./ Week	Credits 03	Evaluation Scheme: SE-I: 25 Marks SE-II: 25 Marks SEE: 50 Marks

Course Objectives:

- To explain ordinary differential equation and solve problems.
  To apply ordinary differential equations for solving simple mechanical and electrical problems.
- To explain linear differential equation and solve problems.
  To apply linear differential equations for solving simple mechanical and electrical problems.
- To explain theory of large sample tests (Z-tests) with application in textiles.
  To explain theory of small sample tests (χ^2, t and F-tests) with application in textiles.
- To explain theory of estimation and theory of statistical quality control for process control and for lot control.

Course Outcomes:

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

- Solve problems related to ordinary differential equations and its applications
- Solve linear differential equations and its applications.
- Identify textile data for testing, test the hypothesis. Calculate and interpret large sample Z-tests. Calculate and interpret small sample t-tests. Calculate and interpret Chi-square and F-tests.
- Apply estimation for unknown parameters. Evaluate and interpret process and lot control methods.

Course Contents		
Unit I	**Differential equations of first order & first degree**	**07 Hours**
a. Definition of exact differential equation, method of solution and examples b. Definition of non-exact differential equation, method of solution and examples c. Definition of linear differential equation, method of solution and examples d. Definition of non-linear differential equation, method of solution and examples		
Unit II	**Linear differential equations of nth order with constant coefficients**	**07 Hours**
a. Definition of LD equations, methods of finding Solution in the form y = C.F. + P.I and examples b. Cauchy's homogeneous linear differential equations with constant coefficients and their solution.		
Unit III	**Applications of ordinary and linear differential equations**	**06 Hours**
a. Applications of ordinary differential equations to solve simple electrical and mechanical engineering problems b. Applications of LD equations to solve simple electrical and mechanical engineering problems		
Unit IV	**Testing of hypothesis and Large sample tests**	**07 Hours**
a. Introduction to testing of hypothesis, b. Basic Concepts viz. Hypothesis, Statistic, Critical Region, Errors in testing, Level of Significance. c. Large sample tests for population mean, equality of population means and examples d. Large sample tests for population proportion, equality of population proportions and examples		

Unit V	Small sample tests and estimation	07 Hours
a.	Small sample tests for population mean, equality of population means and examples	
b.	Test for variance and equality of variances and examples	
c.	Test for goodness of fit and examples	
d.	Test for independence of attributes and examples	
Unit VI	**Statistical quality Control**	**05 Hours**
a.	Introduction to statistical quality control with types process control and lot control.	
b.	Control charts, $\bar{X}, R, np, p$ and C control charts and examples	
c.	Single and double sampling plans. Concepts of lot control AQL, LTPD, AOQ, AOQL, O.C. Curve	

References Books:

1. A Text Book of Applied Mathematics: by J.N. & P.N. Wartikar.
2. Higher Engineering Mathematics by B. S. Grewal.
3. A Text Book on Engineering Mathematics by Bali, Saxena & Iyengar.
4. Mathematical Statistics by J. Fruend.
5. Applied Statistics & Probability of Engineers by Montgomery & Runger.
6. Probability & Statistics for Engineers by Johnson.

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Second Year B. Tech. Fashion Technology (Semester – III)
TFL232: FASHION ILLUSTRATION

Teaching Scheme: Lectures: 03 Hrs/ Week	Credits 03	Evaluation Scheme: SE-I: 25 Marks SE-II: 25 Marks SEE: 50 Marks

Course Objectives:
- To explain difference between real and fashion figure proportions.
- To demonstrate drawing of female, male and children fashion figures.
- To demonstrate rendering of garments and accessories.
- To describe flats and specs for women, men, and children.

Course Outcomes:
At the end of the course, students will be able to
- Explain rules of fashion figure proportions.
- Draw fashion figures.
- Illustrate various types of fabrics and garments with appropriate draping & rendering technique.
- Draw technical drawings for women, men, and children garments.

Course Contents		
Unit I	**Figure Proportions**	**06 Hours**

a. Greek rules of body proportions.
b. Real Figure versus fashion figure.
c. Fashion figure theories: 8 head theory, 10 head theory and 12 Head Theory.
d. Robotized fashion figure.
e. Fleshing out fashion figure.
f. Proportional analysis of head.

Unit II	**Photograph to Fashion Fantasy**	**06 Hours**

a. Drawing from photographs: balance line, center front line, angle and movements.
b. Rotation and counter rotation of body.
c. Multiple poses with a fixed upper body.
d. Models on catwalk.
e. Focus techniques: full shot, medium shot, knee shot, waist shot, close-up, extreme close-up, and detail shot.

Unit III	**Drawing Male & Kids Figure**	**07 Hours**

a. Proportions of male figure.
b. Difference between male versus female figure: Proportions, structure, and gestures.
c. Drawing male figures.
d. Drawing hairstyle.
e. Proportions as per children's age groups: Infants, Toddlers, Child, Teen.

Unit IV	**Clothed figure**	**06 Hours**

a. Draping of folds on clothed figure.
b. Basic body movements and main types of fabric folds: S-shaped, trap & closure, radial, direct thrust, flying & organ-pipe, compressed, fragmented, angular, and hanging folds.
c. Flounces and ruffles.

d. Flat folds and pleats.
e. Giving volume to folds.
f. Lacing & drawstrings.

Unit V	Rendering	07 Hours

a. Rendering techniques.
b. Rendering skin tone.
c. Rendering hairs.
d. Rendering materials: Denim, chiffon, satin, net, knits, fur, leather, etc.
e. Rendering accessories: hats, shoes, scarves, bags, belts, gloves, sunglasses, etc.

Unit VI	Technical Drawing	07 Hours

a. Flats, specs vs illustrations.
b. Tailor's dummy: Size measurement.
c. Production or specification sheet.
d. Flats for women.
e. Flats for men.
f. Flats for children.

References Books:

1. B. Abling, Fashion Sketchbook, Bloomsbury Publishing India Private Limited, ISBN: 1609012283 (2012).
2. E. Drudi, Figure Drawing for Fashion Design, The Pepin Press, ISBN: 9054961503 (2010).
3. E. Drudi, Figure Drawing for Men's Fashion, The Pepin Press, ISBN: 9054961554 (2014).
4. E. Drudi, Fabric Texture and Patterns, The Pepin Press, ISBN: 9057681129 (2008).
5. A. Allen and J. Seaman, Fashion Drawing: The basic principles, Batsford, ISBN: 0713470968 (2003).
6. S. Stipelman, Illustrating Fashion: Concept to Creation, Fairchild Books, ISBN: 1563678306 (2010).
7. S. Burke, Fashion Artist: Drawing Techniques to Portfolio Presentation, Burke Publishing, ISBN: 0958273383 (2013).
8. P. John, Fashion Design Drawing and Presentation, Batsford Ltd. ISBN: 0713435194 (1982).
9. P. John, Fashion Design Illustration (Women), Batsford Ltd. ISBN: 0713466227 (1993).
10. P. John, Fashion Design Illustration (Men), Batsford Ltd. ISBN: 0713466235 (1996).

DKTES Textile and Engineering Institute, Ichalkaranji
Second Year B. Tech. Fashion Technology (Semester – III)
TFL233: FABRIC STRUCTURE AND DESIGN

Teaching Scheme: Lectures: 03 Hrs/ Week	Credits 03	Evaluation Scheme: SE-I: 25 Marks SE-II: 25 Marks SEE: 50 Marks

Course Objectives:
- Explain construction and applications of various compound fabrics.
- Explain color and weave effect.
- Describe concepts of Fabric Engineering.
- Explain application and principle of gauze and leno.

Course Outcomes:
At the end of the course, students will be able to
- Analyze and construct compound fabrics.
- Demonstrate color and weave effect.
- Describe concepts of Fabric Engineering.
- Describe construction of gauze and leno.

Course Contents

Unit I	Fabric engineering	07 Hours

 a. Fabric classification as per structure
 b. Pierces formula for yarn diameter
 c. Cloth cover, cloth geometry of plain fabrics
 d. Cloth geometry of twill fabrics
 e. Practical application of cloth geometry.
 f. Practical application of cover factor.

Unit II	Bedford cords	07 Hours

 a. Plain faced - twill faced Bed ford cords
 b. Wadded – modifications, Welt piques: wadded piques
 c. Plain faced - twill faced.
 d. Loose back and fast back welts and piques, waved pique.

Unit III	Colour and weave effects	08 Hours

 a. Examples of simple colour and weave effects
 b. Stripe weave combination
 c. Check weave combination
 d. Backed Fabrics: Warp and weft back
 e. Wadded backed fabric.
 f. Extra warp figuring, Extra weft figuring
 g. Extra warp figuring with two colours.
 h. Extra weft figuring with two colours.

Unit IV	Double cloth	08 Hours

a. Objects
b. Classification: - self stitched - face to back - back to face -Combination face to back and back to face stitched double cloth.
c. Wadded double cloth - weft and warp Wadded double cloth
d. Center Warp & Weft Stitched double cloth.
e. Interchanging double cloths
f. Multilayer fabrics
g. Open to double fabrics
h. Triple width fabrics, Tubular fabrics.

Unit V	Warp pile produced by	5 Hours

a. Terry weaves
b. Face to face weaving
c. Wire insertion methods.
d. Weft pile: plain back -twill back velveteen
e. Corduroy, Weft plush, Length, density and fastness of pile.

Unit VI	Gauze & Leno	04 Hours

a. Principles
b. Basic sheds
c. Leno with flat steel doups and slotted doups,
d. Point draft or counter leno, applications.

References Books:

1. Grosicki Z., "Watson's Textile Design &Color: Elementary weaves & Figure", Blackwell Science, Commerce place.
2. Grosicki Z., "Advanced Textile Design & Colour:, Blackwell Science, Commerce place.
3. H.Nisbet, "Grammar of textile Design", Tarporevala sons &Co. Pvt. Ltd.,
4. W.S. Murphy, "Textile weaving & Design", Abhishek Publications.
5. Marks &robinson, " woven cloth construction"
6. J.E. Booth," Textile mathematics- vol-I & II"

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Second Year B. Tech. Fashion Technology (Semester – III)
TFL234: FIBRE AND YARN TESTING

Teaching Scheme: Lectures: 03 Hrs/ Week	Credits 03	Evaluation Scheme: SE-I: 25 Marks SE-II: 25 Marks SEE: 50 Marks

Course Objectives:
- ☐ To discuss technical significance of fibre and yarn properties.
- ☐ To discuss the factors affecting fibre and yarn properties.
- ☐ To explain principle and testing methodology of fibre properties.
- ☐ To explain principle and testing methodology of yarn properties.

Course Outcomes:
At the end of the course, students will be able to
- ☐ Understand technical significance of fibre and yarn properties.
- ☐ Discuss factors affecting fibre and yarn properties.
- ☐ Test fibre properties and interpret results obtained for the test.
- ☐ Test yarn properties and interpret the results obtained for the test.

	Course Contents	
Unit I	**Fibre Testing - Longitudinal Dimension**	**06 Hours**

a. Concept, Technical significance of fibre length
b. Fibre length measurement – Hand stapling method, Oil plate method, Comb sorter method, Digital Fibrograph

Unit II	**Fibre Testing - Transverse Dimensions**	**08 Hours**

a. **Fineness :** Concept, Technical significance of fibre fineness
b. Measures of fibre fineness, Measurement of fineness - Gravimetric method, Airflow method
c. **Maturity of cotton** : Concept, Technical significance
d. Measures of maturity, Measurement of maturity - Caustic soda method

Unit III	**Tensile Properties of Fibres And Yarns**	**08 Hours**

a. Importance, Terms and definitions, Stress-strain curve & its importance
b. Factors influencing tensile strength of textiles
c. Types of loading, Principles of tensile testing machines – Pendulum level principle, Strain gauge principle
d. Measurement of fibre strength: Single fibre strength, Bundle strength
e. Measurement o Yarn Strength: - Single yarn Strength, Lea Strength

Unit IV	**Modern Fibre Testing Instruments**	**03 Hours**

a. High Volume Instrument
b. Advanced Fibre Information System.

Unit V	**Yarn Testing - Linear density and Twist**	**06 Hours**

a. **Linear density :** Concept, Count or Yarn number
b. Direct & indirect system of yarn numbering
c. Measurement of yarn number: Electronic weighing balance, Beesley balance.

d.	**Twist in spun yarn :** Concept, Terms and Definitions,	
e.	Expressions of twist, Effect of twist on yarn and fabric properties	
f.	Measurement of twist – Untwist and twist method, Twist take-up method.	
Unit VI	**Evenness of Yarn**	**08 Hours**
a.	Concept, Causes of unevenness, Classification of variations	
b.	Effects of unevenness, Measures of irregularity - PMD, CV,	
c.	Measurement of unevenness -Visual examination, Capacitance principle,	
d.	Imperfections and Classimat faults,	
e.	**Yarn Hairiness :** Concept, Causes, Effects	
f.	Measurement of yarn hairiness - Photoelectric method	

References Books:

1. Principles of Textile Testing, J.E.Booth, CBS Publishers & Distributors, 1996.
2. Physical Properties of Textile Fibres, Morton &Hearle.
3. Physical Testing of Textiles, B. P. Saville.
4. Textile Testing- Fibre, Yarn and Fabric, ArindamBasu, Published by SITRA, Coimbatore.

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Second Year B. Tech. Fashion Technology (Semester – III)
TFL235: TEXTILE MANUFACTURING - III

Teaching Scheme: Lectures: 03 Hrs/ Week	Credits 03	Evaluation Scheme: SE-I: 25 Marks SE-II: 25 Marks SEE: 50 Marks

Course Objectives:
- To discuss the compact spinning, yarn doubling, singeing and conditioning.
- To discuss the alternative spinning techniques like Rotor spinning, Friction spinning, Air-jet spinning, Twist less spinning and Twilo spinning.
- To classify types, structures and manufacturing of fancy yarns.
- To explain requirements and manufacturing techniques of hosiery yarns sewing thread and embroidery thread.

Course Outcomes:
At the end of the course, students will be able to
- Explain the compact spinning, yarn doubling, singeing and conditioning.
- Explain alternative spinning techniques like Rotor spinning, Friction spinning, Air-jet spinning, Twistless spinning and Twilo spinning.
- Illustrate the types, structure and manufacturing techniques of fancy yarns.
- Describe the requirements and manufacturing techniques of hosiery yarns, sewing thread and embroidery thread

Course Contents		
Unit I	**Compact spinning, conditioning, singeing and doubling**	**08 Hours**

a. **Compact spinning:** Compact spinning concept, methods of compact spinning, compact yarn properties
b. **Yarn conditioning:** Objects of yarn conditioning, conventional and modern yarn conditioning techniques, advantages of yarn conditioning.
c. **Yarn singeing:** object and method of yarn singeing.
d. **Yarn Doubling:** Objects, types of doubling twist, twist balancing, Construction and working of doubling machines – Ring doubler, Up-twister and Two for One twister (TFO)

Unit II	**Rotor spinning**	**06 Hours**

a. **Rotor spinning:** Advantages and disadvantages of ring spinning and new spinning techniques, working principle of rotor spinning, rotor spinning preparatory process.
b. **Rotor spinning working and construction:** construction of rotor feed zone, opening zone, rotor and package winding.
c. **Rotor yarn properties:** comparison of rotor yarn with ring yarn.

Unit III	**Air-jet spinning, Friction spinning**	**05 Hours**

a. **Air-jet spinning:** Working principle, working of Murata Jet spinning machine (MJS), Air Vortex spinning machine.
b. **Friction spinning:** working principle of friction spinning, working of DREF-II and DREF-III spinning machine.
c. **Other new spinning techniques:** Self twist -Repco spinning, Wrap spinning and Twilo spinning.

Unit IV	Fancy Yarns	09 Hours

a. Introduction to fancy yarns, Various ways to produce types of fancy yarns -
b. Structure of some important fancy yarn with manufacturing techniques in short.
c. Manufacturing of Slub yarn, multi twist, multi count yarn on Ring and Rotor spinning.
d. Manufacturing techniques of Crep yarn, Blended Fancy (mélange) yarns.
e. Manufacturing techniques of SIRO, Bobtex yarn, chenille yarn.

Unit V	Hosiery and Elastane Yarns	04 Hours

a. Hosiery yarn: Requirements of hosiery yarn.
b. Raw materials, properties and applications of hosiery yarns.
c. Elastane (polyurethane) Yarns: production of core Spun Iycra yarns on ring spinning.
d. Air Covered Elastane Yarns: production of air cover Iycra yarns on air covering machine.
e. Applications of elastane yarn.

Unit VI	Sewing Threads and Embroidery Yarn	07 Hours

a. Sewing Threads: Introduction and importance of Sewing Thread. Characteristics or requirements of Sewing Thread.
b. Thread construction, types, and production method of sewing threads.
c. Types of thread package, Thread storage and degradation.
d. Embroidery Yarn: Introduction of thread construction, Raw material used, Characteristics of embroidery yarn
e. Thread production methods and types of thread package of embroidery yarn.

References Books:

1. The Rieter Manual of Spinning, Volume 6, Alternative Spinning Systems, Dr. Herbert Stalder.
2. The Rieter Manual of Spinning, Volume 4, Ring Spinning, Werner Klein and Dr. Herbert Stalder.
3. Two for one Twister technology and Technique for spun yarns by H. S. Kulkarni and HVS Murty
4. Ring frame & doubling by Prof. A. R. Khare.
5. Fancy yarns –Their manufacture and application by R H Gong and R.M Wright, The textile institute -CRC- Wood head publishing limited.
6. 'Modern Yarns for Modern Fabrics Seminar' Conference proceedings. By TTI, The Textile Inst. Publisher.
7. Yarns & Fabric Classification Main Items in wool and blends, Italtex Editor.
8. Textile guide synthesis to create yarns & fabrics, Italtex Editor
9. 'Sewing Threads' Textile progress vol.30 no.3/4, by J.O. Ukponmwan, The Textile Inst. Publisher.

DKTES Textile and Engineering Institute, Ichalkaranji
Second Year B. Tech. Fashion Technology (Semester – III)
TFL236: PATTERN ENGINEERING –I

Teaching Scheme: Lectures: 03 Hrs/ Week	Credits 03	Evaluation Scheme: SE-I: 25 Marks SE-II: 25 Marks SEE: 50 Marks

Course Objectives:
- ☐ To understand basics of pattern making department
- ☐ To describe the drafting of five set pattern drafting
- ☐ To describe the dart related designs
- ☐ To explain the drafting process of different components

Course Outcomes:
At the end of the course, students will be able to
- ☐ Understand basics of pattern making department
- ☐ Describe the drafting of five set pattern drafting
- ☐ Describe the dart related designs
- ☐ Explain the drafting process of different components

Course Contents		
Unit I	**Introduction**	**08 Hours**

   a. Definition of pattern engineering, roles and responsibilities of pattern maker, pattern making tools and importance.
   b. Skills required for pattern making, details on the pattern and their importance & Types of patterns.
   c. Pattern making process in apparel industry

Unit II	**Measurements**	**06 Hours**

   a. Fabric Terms and Production Terms .
   b. Size chart and Measuring of Sizes
   c. Importance of paper exercise and fabric exercise

Unit III	**Drafting five set Pattern**	**08 Hours**

   a. Drafting the basic pattern set – Front, Back, Skirt and sleeve
   b. Seam allowance meaning and importance
   c. Testing of fitting of basic blocks & correction

Unit IV	**Dart Manipulation**	**06 Hours**

   a. Dart related terminologies and its importance
   b. Types of dart manipulation.
   c. Creating styles through dart manipulation.

Unit V	**Designing with Darts**	**06 Hours**

   a. Introduction, Tuck darts, pleats, flares, gathers fullness, Dart clusters, dart equivalents, multiple darts.
   b. Drafting and stitching of Graduated dart and Radiated dart.

Unit VI	**Garment Components and Closures**	**05 Hours**

   a. Patterns in different apparels.
   b. Drafting of different types of pockets, cuff, placket, Yoke, collar Etc.
   c. Introduction to different garment closures.

References Books:

1. Pattern making for fashion design by Helen Joseph Armstrong fifth edition, Pearson Education, Inc. ISBN-10: 0-13-606934-7

2. Pattern grading for women's clothes by Gerry Cooklin, Blackwell Publishing. ISBN 0-632-05692-4

3. Metric pattern cutting for women's wear by Winifred Aldrich, Blackwell Publishing. 5th edition, ISBN: 978-1-118-37205-0.

4. Metric pattern cutting for men's wear by Winifred Aldrich, Blackwell Publishing. 5th edition, ISBN 978-81-265-3241-4

5. The art of fashion draping by connieamaden-crawford, third edition, Fairchild Publications, Inc. ISBN 81-8710-7359

6. Draping for fashion design by Hilde Jaffe and NurieRelis, fourth edition, Pearson Education, Inc. ISBN 978-81-317-2696-9

DKTES Textile and Engineering Institute, Ichalkaranji
Second Year B. Tech. Fashion Technology (Semester – III)
TFP237:   FASHION ILLUSTRATION LAB

Lab Scheme: Practical: 02 Hrs/ Week	Credits 01	Evaluation Scheme: CIE: 50 Marks

List of Experiments

1	Drawing of 8-head figure.
2	Drawing of 10-head and 12-head fashion figures.
3	Drawing of fashion figures from photographs.
4	Drawing of models on catwalk.
5	Drawing of different types of focus techniques.
6	Drawing of male figure.
7	Drawing of children figure.
8	Drawing of different types of fabric folds.
9	Rendering of skin tone and hairs.
10	Rendering of fabrics.
11	Drawing of flats for women.
12	Drawing of flats for men.

Submission – Completed Journal.

DKTES Textile and Engineering Institute, Ichalkaranji
Second Year B. Tech. Fashion Technology (Semester – III)
TFP238:   FABRIC STRUCTURE AND DESIGN LAB

Lab Scheme: Practicals: 02 Hrs/ Week	Credits 01	Evaluation Scheme: CIE: 50 Marks

List of Experiments

1	Fabric analysis: bedford cords pique.
2	Fabric analysis: extra warp fabric.
3	Fabric analysis: color and weave effects: checks.
4	Fabric analysis: stripe.
5	Fabric analysis: pile fabrics.
6	Fabric analysis: double cloth.
7	Fabric analysis: leno.
8	Sample weaving of bedford cloth.
9	Sample weaving of extra weft.
10	Sample weaving of double cloth.
11	Sample weaving of terry pile fabric.
12	Sample weaving of weft backed cloth.

Submission – Completed Journal.

DKTES Textile and Engineering Institute, Ichalkaranji Second Year B. Tech. Fashion Technology (Semester – III) TFP239: FIBRE AND YARN TESTING LAB		
Lab Scheme: Practicals: 02 Hrs/ Week	Credits 01	Evaluation Scheme: CIE: 50 Marks SEE: 50 Marks

List of Experiments

1	Fibre length measurement by grease plate method
2	Fibre length measurement by Comb sorter method
3	Fibre maturity measurement by caustic soda
4	Measurement of fibre fineness by airflow instrument
5	Measurement of fibre fineness by gravimetric principle
6	Determination of fibre parameters by AFIS
7	Determination of yarn number
8	Determination of twist in single yarn
9	Determination of twist in double yarn
10	Study of weak-link effect
11	Determination of lea strength
12	Determination of evenness of yarn

Submission – Completed Journal.

DKTES Textile and Engineering Institute, Ichalkaranji
Second Year B. Tech. Fashion Technology (Semester – III)
TFP240: PATTERN ENGINEERING-I LAB

Lab Scheme: Practicals: 02 Hrs/ Week	Credits 01	Evaluation Scheme: CIE: 50 Marks

List of Experiments

1	Study of pattern making tools, stitching machine live model and garment.
2	Machine practice to sew lines in various shapes, following a guide line on SNLS machine. (Paper exercise)
3	Machine practice to sew lines in various shapes, following a guide line on SNLS machine. (Fabric exercise)
4	Study of measurements of dress form
5	Prepare samples for different types of seams
6	Draft five set patterns and check for fit.
7	Stitch five set patterns and check for fit
8	To develop patterns by using dart manipulation techniques.
9	Prepare and stitch patterns for graduated and radiating darts
10	Adopt and stitch patterns for collar with stand and peter pan collar
11	Draft and prepare samples for different Garment Components – Pockets
12	Draft and prepare samples for different Garment Components – Placket and Cuff

Submission – Completed Journal.

DKTES Textile and Engineering Institute, Ichalkaranji
Second Year B. Tech. Fashion Technology (Semester – III)
TFP241: DIGITAL FASHION ILLUSTRATION

Lab Scheme: Practical: 02 Hrs/ Week	Credits 01	Evaluation Scheme: CIE: 50 Marks SEE: 50 Marks

Course Objectives:
- ☐ To explain tools and menus used in bitmap and vector software.
- ☐ To demonstrate drawing of fashion figures.
- ☐ To demonstrate rendering of garments and accessories.
- ☐ To demonstrate drawing of flats.

Course Outcomes:
At the end of the course, students will be able to
- ☐ Select appropriate software and tools for drawing and rendering fashion figures, fabrics, and flats.
- ☐ Illustrate fashion figures.
- ☐ Draw and render various types of fabrics, garments, and accessories.
- ☐ Create fashion flats according to Fashion industry standard.

List of Experiments

1	To study image manipulation tools and techniques in Adobe Photoshop.
2	To study glamour photo retouching techniques in Adobe Photoshop.
3	To study colour reduction of scanned fabric in Adobe Photoshop.
4	To create repeats of a design pattern in Adobe Photoshop.
5	To render different types of fabrics in Adobe Photoshop.
6	To render prints, embroidery, and ornaments in Adobe Photoshop.
7	To render fabric folds, pleats, flounces, and ruffles in Adobe Photoshop.
8	To create presentation boards in Adobe Photoshop.
9	To create garment flats in Adobe Illustrator.
10	To develop mockups for different types of garments in Adobe Illustrator.
11	To draw fashion croquis and render skin in Adobe Illustrator.
12	To drape dresses on fashion figure in Adobe Illustrator.

Submission – Completed Journal.

References Books:
1. M. Kathleen Coussy and S. Greenberg, Rendering Fashion, Fabric & Prints with Adobe Photoshop, Pearson Education, ISBN: 978-0130494092 (2004).
2. K. Tallon, Digital Fashion Illustration with Photoshop & Illustrator, Batsford Ltd. ISBN: 0713490586 (2008)
3. M. Centne, Fashion Designer's Handbook for Adobe Illustrator, John Wiley & Sons, ISBN: 1405160551 (2007)
4. S. Lazear, Adobe Photoshop for Fashion Design, Pearson, ISBN: 0131191934 (2009)
5. K. Tallon, Creative Fashion Design with Illustrator, Batsford Ltd. ISBN: 1849941203 (2013)

DKTES Textile and Engineering Institute, Ichalkaranji
Second Year B. Tech. Fashion Technology (Semester – III)
ADL201-A: ENVIRONMENTAL STUDIES

Teaching Scheme: Lectures: 02 Hrs/ Week		Evaluation Scheme: SEE-: 70 Marks CIE (Project work) -: 30 Marks (Annual Evaluation in Sem. IV)

*Evaluation of the course will be in Sem. IV based on syllabus of Sem. III and Sem. IV

Course Objectives:
- ☐ To recall fundamental physical and biological principles those govern natural processes.
- ☐ To state the importance of ecological balance for sustainable development.
- ☐ To describe the impacts of developmental activities and mitigation measures and to further understand the environmental policies and regulations.
- ☐ To identify the complex relationships between scientific approaches to environmental issues and political, social, economic, and ethical perspectives on the environment.

Course Outcomes:
At the end of the course, students will be able to
- ☐ Develop an understanding of different natural resources including renewable resources.
- ☐ Realize the importance of ecosystem and biodiversity for maintaining ecological balance.
- ☐ Aware of important acts and laws in respect of environment.
- ☐ Demonstrate critical thinking skills in relation to environmental affairs

Course Contents		
Unit I	**Significance of environmental studies**	**09 Hours**

- a. Multidisciplinary nature of environmental studies Need for public awareness.
- b. Forest resources: Use and over-exploitation, deforestation, Timber extraction, mining, dams and their effects on forests and tribal people.
- c. Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems.
- d. Mineral resources: Usage and exploitation, environmental effects of extracting and using mineral resources.
- e. Food resources: World food problem, changes caused by agriculture effects of modern agriculture, fertilizer-pesticide problems.
- f. Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources.
- g. Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification.
- h. Role of an individual in conservation of natural resources.
- i. Equitable use of resources for sustainable lifestyle.

Unit II	**Ecosystems**	**09 Hours**

Concept of an ecosystem, Structure and function of an ecosystem, Producers, consumers and decomposers, Energy flow in the ecosystem, Ecological succession, Food chains, food webs and ecological pyramids. Introduction, types, characteristics features, structure and function of the following Ecosystem: - a) Forest ecosystem, b) Grassland ecosystem, c) Desert ecosystem, d) Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

Unit III	Biodiversity and its Conservation	08 Hours
	Introduction – Definition: genetic, species and ecosystem diversity, Biogeographical classification of India, Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values.; Biodiversity at global, National and local levels.; India as a mega-diversity nation; Western Ghats as a bio-diversity region; Hot-spots of biodiversity; Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts; Endangered and endemic species of India; Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.	

References Books:

1. Clark R. S., Marine Pollution, Clanderson Press Oxford (TB) Pg No. 6.
2. Cunningham, W. P. Cooper, T. H. Gorhani, E. & Hepworth, M. T. 2001, Environmental Encyclopedia, Jaico Publ. House, Mumbai, 1196p.
3. De A. K., Environmental Chemistry, Wiley Eastern Ltd.
4. Down to Earth, Centre for Science and Environment ®
5. Gleick, H., 1993, Water in crisis, Pacific Institute for Studies in Dev., Environment & security. Stockholm Env. Institute. Oxford Univ. Press 473p.
6. Hawkins R. e., Encyclopedia of Indian Natural History, Bombay Natural History Society, Bombay

Second Year B. Tech Fashion Technology
Semester- IV

Sr. No.	Course Code	Name of the Course	Group	Theory Hrs/ Week	Tutorial Hrs/ Week	Practical Hrs/ Week	Total	Credits
1	TFL251	Textile Mathematics-IV	BSC	3			3	3
2	TFL252	Textile Electronics	ESC	4			4	4
3	TFL253	Textile Chemical Processing	PCC	3			3	3
4	TFL254	Textile Manufacturing - IV	PCC	3			3	3
5	TFL255	Pattern Engineering - II	PCC	3			3	3
6	TFL256	Testing of Textiles and Apparels	PCC	3			3	3
7	TFP257	Textile Electronics Lab	ESC			2	2	1
8	TFP258	Textile Chemical Processing Lab	PCC			2	2	1
9	TFP259	Textile Manufacturing - IV Lab	PCC			2	2	1
10	TFP260	Pattern Engineering - II Lab	PCC			2	2	1
11	TFP261	Testing of Textiles and Apparels Lab	PCC			2	2	1
12	ADL201	Environmental Studies Lab	MC		2		2	
		Total		**19**	**2**	**10**	**31**	**24**

Group Details

HSMC: Humanities, Social Science & Management Courses

BSC: Basic Science Courses

ESC: Engineering Science Courses

PCC: Professional Core Courses

PEC: Professional Electives Courses

OEC: Open Elective Courses

PST: Project / Seminar / Ind. Training

MC: Mandatory Courses

DKTES Textile and Engineering Institute, Ichalkaranji
Second Year B. Tech. Fashion Technology (Semester –IV)
TFL251: TEXTILE MATHEMATICS-IV

Teaching Scheme: Lectures: 03 Hrs./ Week	Credits 03	Evaluation Scheme: SE-I: 25 Marks SE-II: 25 Marks SEE: 50 Marks

Course Objectives:
- ☐ To explain Laplace transform & inverse of it with examples.
  To apply Laplace transform for solving L.D. equations
- ☐ To teach vector differentiation with examples.
  To define Fourier series and explain formulae and solve examples.
- ☐ To explain Analysis of Variance types one way, two way analysis of variance and examples.
- ☐ To explain DOE with its importance, basic principles, basic designs CRD, RBD, LSD and factorial experiments

Course Outcomes:
At the end of the course, students will be able to
- ☐ Solve problems related to Laplace and inverse Laplace transforms and L.D. equations using Laplace transforms.
- ☐ Solve problems of Fourier series and Solve problems of vector differentiation.
- ☐ Solve and interpret problems of one-way and two-way ANOVA.
- ☐ Solve and interpret problems of CRD, RBD, LSD two factor and three factor factorial experiments.

Course Contents		
Unit I	**Laplace Transforms and its application to L.D Equations**	**08 Hours**

a. Definition, Laplace transforms of standard functions, of derivatives and integrals with examples.
b. Inverse Laplace transforms by simplification, partial fraction and convolution method
c. Method of solving L.D. equations with initial conditions using Laplace transforms and examples.

Unit II	**Vector differentiation**	**05 Hours**

a. Definition of vector function of scalar t and its derivative with interpretation. Vector tangent, velocity and acceleration vectors with examples.
b. Definition of scalar, vector valued function of point $p(x, y, z)$. Definition of gradient, divergence, curl, directional derivative, solenoidal, irrotational vector fields with examples

Unit III	**Fourier Series**	**06 Hours**

a. Full range Fourier series, definition, Euler's formulae for constants with examples of $(0, 2\pi), (-\pi, \pi), (0, 2C), (-C, C)$.
b. Hal range Fourier series, definition, Euler's formulae for constants with examples of $(0, \pi), (0, C)$.

Unit IV	**Analysis of Multivariate Data**	**04 Hours**

a. Multivariate data, multiple correlation coefficients, partial correlation coefficients with examples.
b. Multiple regression, multiple regression equations with examples.

Unit V	**Analysis of Variance**	**08 Hours**

a. Introduction of Analysis of Variance, One-way analysis of variance with examples.
b. Two-way analysis of variance with one observation per cell and examples.
c. Two-way analysis of variance with m observations per cell and examples.

Unit VI	Design of experiments with basic designs and factorial experiments	08 Hours
a.	Introduction of design of experiments, basic principles and basic designs.	
b.	Basic designs CRD, RBD, and LSD with examples.	
c.	Factorial experiments, 2^2 and 2^3 factorial experiments with examples.	

References Books:

1. A Text Book of Applied Mathematics: by J.N. & P.N. Wartikar.
2. Higher Engineering Mathematics by B. S. Grewal.
3. A Text Book on Engineering Mathematics by Bali, Saxena & Iyengar.
4. Mathematical Statistics by J. Fruend.
5. Applied Statistics & Probability of Engineers by Montgomery & Runger.
6. Probability & Statistics for Engineers by Johnson.

DKTES Textile and Engineering Institute, Ichalkaranji
Second Year B. Tech. Fashion Technology (Semester – IV)
TFL252: TEXTILE ELECTRONICS

Teaching Scheme: Lectures: 04 Hrs/ Week	Credits 04	Evaluation Scheme: SE-I: 25 Marks SE-II: 25 Marks SEE: 50 Marks

Course Objectives:
- To explain the operation and applications of semiconductor devices, power semiconductor devices and electromechanical devices
- To describe working principle of different types of sensors and transducers
- To explain working of digital circuits, microprocessor, microcontroller and PLC
- To demonstrate applications of electronics in textiles

Course Outcomes:
At the end of the course, students will be able to
- Describe operation and application of semiconductor devices, power semiconductor devices and electromechanical devices
- Explain working principle of different types of sensors and transducers
- Explain working of digital circuits, microprocessor, microcontroller and PLC
- Demonstrate applications of electronics in textiles

Course Contents		
Unit I	**Basic Electronics and Semiconductor devices**	**19 Hours**

Classification of materials- conductors, insulators and semiconductors;
Electronics components, passive components- resistors, capacitors and inductors;
Semiconductor diode, Rectifiers- half wave and full wave; Filters-shunt capacitor filter, series inductor filter; Zener diode, zener regulator; Transistor- Construction, working, configurations, common emitter characteristics, Basic CE amplifier

Unit II	**Op-amp and power semiconductor devices**	**08 Hours**

Op-amp- Introduction, block diagram, symbol, ideal op-amp, IC741-pinout and specifications;
Open loop op-amp configuration, drawbacks of open loop configuration;
Concept of feedback in amplifier, +ve and –ve feedback, closed loop op-amp configuration
Power semiconductor devices: SCR construction, operation, turning ON and OFF of SCR, SCR characteristics, SCR in DC Motor speed control; Triac- Construction, working and characteristics, diac- Construction, working and characteristics, AC power control using triac

Unit III	**Transducers and electromechanical devices**	**08 Hours**

Introduction, transducer classification – Primary and secondary transducers, active and passive transducers, analog and digital transducers, basic requirements of transducers;
Photodiode, phototransistor, LDR, LED, Optocouplers, Optical shaft encoders;
Pressure measurement –bourdon tubes; Temperature Transducers – RTD, Thermocouple, Thermistors;
Strain gauge- working principle, bonded type strain gauge; Linear variable differential transformers (LVDT), Capacitive transducers, Piezo electric transducers, Proximity sensors
Electromechanical devices- relay, solenoid valve

Unit IV	Digital Electronics	09 Hours
	Difference between analog and digital electronics, digital gates, 4:1 multiplexer, 1:4 demultiplexer, 3:8 decoder, 8:3 encoder, level triggered RS flip flop, edge triggered D, 4-bit register, memory & its types	

Unit V	Microprocessor, Microcontroller and PLC	04 Hours
	8085 microprocessor features, pin diagram and architecture; 8051 microcontroller features, block diagram; PLC block diagram	

Unit VI	Automation in Textiles	04 Hours
	Automatic textile control systems- feedback, feed forward and combined; applications of electronics in spinning, weaving, testing and finishing	

References Books:

1. Electronics Components and Materials by Madhuri Joshi
2. A Textbook of Applied Electronics by R. S. Sedha
3. Basic Electronics by B. L. Therja
4. Electrical and Electronics Measurements and Instrumentation by A.K.Sawhey, Dhanpat Ria and Sons Pub.
5. Instrumentation Devices & Systems by C.S. Rangan, G.R. Sharma,TMH Pub
6. Op-amp and Linear Integrated Circuits by Ramakant Gaykwad
7. Digital Principles and applications by Malvino and leach
8. Microprocessor Architecture, Programming and applications with 8085 by Ramesh Gaonkar.
9. The 8051 Microcontroller Architecture, Programming and Applications by Kenneth J, Ayala.
10. Electronic Controls for Textile Machine – Hiren Joshi and Gouri Joshi, NCUTE
11. 8085 Microprocessor by Vibhute & Borole

DKTES Textile and Engineering Institute, Ichalkaranji
Second Year B. Tech. Fashion Technology (Semester – IV)
TFL253: TEXTILE CHEMICAL PROCESSING

Teaching Scheme: Lectures: 03 Hrs/ Week	Credits 03	Evaluation Scheme: SE-I: 25 Marks SE-II: 25 Marks SEE: 50 Marks

Course Objectives:
- ☐ To describe the grey inspection and mechanical processing of textiles
- ☐ To describe the pretreatments of textiles
- ☐ To explain the colouration processes of textiles like dyeing and printing
- ☐ To explain the objectives and effects of various finishes

Course Outcomes:
At the end of the course, students will be able to
- ☐ Understand the importance of grey inspection and mechanical processes
- ☐ Understand the process of desizing, scouring, bleaching and mercerization
- ☐ Understand the dyeing and printing colouration processes on cotton and polyester
- ☐ Understand the objects and effects of various finishes

	Course Contents	
Unit I	**Grey inspection and mechanical processes**	**05 Hours**

a. Importance of grey inspection, Inspection machines for woven and knit goods, Four point & ten point system & numerical for acceptance & rejection of fabrics, Defect analysis
b. Importance of stitching, Types of stitches
c. Working of shearing and cropping machine
d. Singeing objects, working of Gas singeing machine. Gas singeing of woven & knitted fabrics
e. General process sequence

Unit II	**Desizing and scouring**	**06 ours**

a. **Desizing**: Objects, methods and classification of desizing.
   Desizing of Cotton, P/C and Polyester fabrics
   Evaluation of efficiency of desizing, Degumming of silk
b. **Scouring**: Objects, Concept of alkaline scouring
   Study of batch-wise & continuous methods of scouring
   Scouring of cotton, blends and synthetic fabrics, evaluation of efficiency of scouring

Unit III	**Bleaching and mercerization**	**08 Hours**

a. **Bleaching:** Objects of bleaching, Introduction to bleaching agents like sodium hypochlorite and hydrogen peroxide
   Bleaching of cotton, blends and synthetics
   Batch & continuous machinery for bleaching of substrate in different forms
   Bleaching of wool, silk, evaluation of efficiency of bleaching
b. **Mercerization :** Object of mercerization, Changes in cotton after mercerization
   Study of machinery used for mercerization of yarn, woven and knit fabrics
   Effect of various parameters on mercerization efficiency, Concept of hot mercerization
   Evaluation of mercerization efficiency using barium activity number

Unit IV	Dyeing	07 Hours

a. Introduction to dyeing, classification of colouring matters

Methods of dyeing: batch, semi-continuous and continuous process

Dyeing of cellulosic fibres using direct, reactive, vat and sulphur dyes.

b. Dyeing of polyester with disperse dye by carrier, HTHP and Thermosol methods

Unit V	Printing	8 Hours

a. Difference between dyeing and printing

Styles of printing: Direct, discharge, resist style

Methods of printing: tie and dye, batik, block printing, screen printing

Printing of cotton by various styles using reactive dye

b. Printing of polyester by various styles using disperse dye
c. Pigment printing
d. Concept of transfer printing, digital printing

Unit VI	Finishing	05 Hours

a. Objects of finishing, classification of finishes. Mechanical and chemical finishing, application of softeners

Functional finishes: Resin finishing, flame retardant finish, antimicrobial finish

b. Heat setting and weight reduction of polyester material

References Books:

1. Chemical processing of textiles, NCUTE publication.
2. Chemistry and technology of fabric preparation and finishing by Dr. C. Tomasino,NCSU, USA
3. Introduction to Textile bleaching by J.T. Marsh.
4. Bleaching, Dyeing & Chemical Technology of Textile fibres by E.R. Trotman.
5. Technology of Bleaching by V.A. Shenai.
6. Textiles Fiber to Fabric by Bernard P. Corbman.
7. Technology of Dyeing by V. A. Shenai.
8. Technology of Printing by V. A. Shenai
9. Textile Printing by L.W.C. Miles.
10. Technology of Finishing by V. A. Shenai.

DKTES Textile and Engineering Institute, Ichalkaranji
Second Year B. Tech. Fashion Technology (Semester – IV)
TFL254: TEXTILE MANUFACTURING- IV

Teaching Scheme: Lectures: 03 Hrs/ Week	Credits 03	Evaluation Scheme: SE-I: 25 Marks SE-II: 25 Marks SEE: 50 Marks

Course Objectives:
- ☐ Explain modern weaving preparatory processes.
- ☐ To describe automatic weaving, shuttle less weaving and non – woven fabric manufacturing
- ☐ To describe principles of jet weft insertion and continuous weft insertion
- ☐ To explain the techno-economics of different shuttle less weaving and fabric inspection methods

Course Outcomes:
At the end of the course, students will be able to
- ☐ Explain modern weaving preparatory processes
- ☐ Describe automatic weaving, shuttle less weaving and non-woven fabric manufacturing.
- ☐ Describe the weft insertion in Airjet, Waterjet, Circular, Multiphase and Tri-axial looms.
- ☐ Explain the sample weaving process and fabric inspection systems.

Course Contents		
Unit I	**Weaving preparatory**	**06 Hours**

- a.   Introduction to weaving preparatory
- b.   **Winding:** Introduction to winding machine
- c.   Constructional details of winding machine
- d.   Features of modern winding machine.
- e.   **Warping:** Classification,
- f.   Features of modern warping machine.
- g.   **Sizing:** Introduction to sizing machine
- h.   Features of modern sizing machine

Unit II	**Weaving**	**10 Hours**

- a.   **Automatic Weaving**: Limitations of ordinary looms,
- b.   Types of Auto looms, applications of auto looms,
- c.   **Shuttle less Weaving**: Classification,
- d.   Weft insertion principle of Projectile, applications, selvedge weave
- e.   Principle of rapier weft insertion through various mechanisms such as single rapier, double rapier,
- f.   Rigid and flexible rapier
- g.   Bi-phase & twin rapier. Selvedge formation,
- h.   Multicolour feeding mechanism, Field of application.
- i.   Fabric defects and remedies

Unit III	**Non-Woven Fabrics**	**06 Hours**

- **a.**   **Introduction to non-woven fabrics**
- b.   Different methods of production of non-woven
- c.   Needle punched non-woven
- d.   Chemical method of forming Non wovens
- e.   Thermal bonded method of forming Non wovens
- f.   Applications of non-woven fabrics.

Unit IV	Jet weft insertion	09 Hours

a. Principles of Airjet weft insertion from single nozzle,
b. Confusor and multi nozzle airjet weaving machines and their elements
c. Take up, let off and Auxiliary motions.
d. Water jet weft insertion system,
e. Water consumption, quality and its requirement.
f. Field of applications, commercial viability of Airjet weaving machines
g. Field of applications, commercial viability of Waterjet weaving machines.
h. Techno-economical ratings of different shuttleless technologies.

Unit V	Multiphase, Circular and Tri-axial weaving	05 Hours

a. Principle of Multiphase weaving, Passage of yarn
b. Study of Sulzer M8300 multiphase weaving machine, Field of applications.
c. Principle of Circular weaving, Passage of yarn, Classification, Yarns used and field of applications.
d. Principle of Tri-axial weaving
e. Properties and applications of tri-axial fabric, Yarns used.

Unit VI	Sample weaving and Fabric inspection	03 Hours

a. Concept of sample weaving.
b. Importance of fabric inspection,
c. Different fabric inspection systems

References Books:

1. Principle of weaving by Marks A. T. C. & Robinson
2. Essential Calculations of Practical Cotton Spinning by T.K. Pattabhiraman.
3. Modern Preparation & weaving Machines by A. Ormerod.
4. Non-wovens by N. N. Bannerjee
5. Manual of Non-wovens by Dr. RadkoKrima
6. Shuttleless weaving by Svaty
7. Weaving machines, mechanism, management By Talukdar, AjagaokarSriramulu
8. Shuttleless weaving By Talav and Svaty
9. Modern developments in weaving Machinery By Duxbury
10. Shuttleless weaving by NCUTE programme by IITDelhi.
11. Brouchers and Machine pamphlets of various machine manufacturers
12. Airjet weft Insertion By L. Vangheluwe, Textile Progess

DKTES Textile and Engineering Institute, Ichalkaranji
Second Year B. Tech. Fashion Technology (Semester – IV)
TFL255: PATTERN ENGINEERING- II

Teaching Scheme: Lectures: 03 Hrs/ Week	Credits 03	Evaluation Scheme: SE-I: 25 Marks SE-II: 25 Marks SEE: 50 Marks

Course Objectives:
- To understand the process of grading and marker making
- To describe the different types of skirts
- To describe the draping process
- To explain the drafting process of kids wear

Course Outcomes:
At the end of the course, students will be able to
- Understand the process of grading and marker making
- Describe the different types of skirts
- Describe the draping process
- Explain the drafting process of kids wear

Course Contents		
Unit I	**Grading and Marker making**	**08 Hours**

    a. Introduction to grading, terminologies and methods of grading
    b. Grading of basic block and components
    c. Meaning of marker making, its significance and types of marker.
    d. Introduction to computerized pattern making

Unit II	**Skirts**	**06 Hours**

    a. Types of skirts
    b. Drafting of different types of skirts

Unit III	**Style lines and Cowls**	**06 Hours**

    a. Introduction to style lines and drafting of different types of style lines
    b. Introduction to Cowls and drafting of different types of Cowls

Unit IV	**Sleeve and Cuff**	**06 Hours**

    a. Introduction, Terminologies, types
    b. Designing with different types of sleeves and cuff
    c. Introduction to sleeve body combination

Unit V	**Draping**	**08 Hours**

    a. Introduction of draping and terminologies
    b. Preparation of fabric for draping
    c. Elements of fabrics, Principles and fitting methods
    d. Draping of basic bodies and other components

Unit VI	**Kids wear**	**05 Hours**

    a. Different types of kids wear
    b. Factors to be considered for kids wear
    c. Drafting of Romper, A line frock, baba suit and other kids wear

References Books:

1. Pattern making for fashion design by Helen Joseph Armstrong fifth edition, Pearson Education, Inc. ISBN-10: 0-13-606934-7

2. Pattern grading for women's clothes by Gerry Cooklin, Blackwell Publishing. ISBN 0-632-05692-4

3. Metric pattern cutting for women's wear by Winifred Aldrich, Blackwell Publishing. 5th edition, ISBN: 978-1-118-37205-0.

4. Metric pattern cutting for men's wear by Winifred Aldrich, Blackwell Publishing. 5th edition, ISBN 978-81-265-3241-4

5. The art of fashion draping by connieamaden-crawford, third edition, Fairchild Publications, Inc. ISBN 81-8710-7359

6. Draping for fashion design by Hilde Jaffe and NurieRelis, fourth edition, Pearson Education, Inc. ISBN 978-81-317-2696-9

DKTES Textile and Engineering Institute, Ichalkaranji
Second Year B. Tech. Fashion Technology (Semester – IV)
TFL256: TESTING OF TEXTILES AND APPARELS

Teaching Scheme: Lectures: 03 Hrs./ Week	Credits 03	Evaluation Scheme: SE-I: 25 Marks SE-II: 25 Marks SEE: 50 Marks

Course Objectives:
- To describe significance of fabric and apparel properties.
- To describe the factors affecting fabric and apparel properties.
- To explain principle and testing methodology of fabric properties.
- To explain principle and testing methodology of apparels and accessories.

Course Outcomes:
At the end of the course, students will be able to
- Understand significance of fabric and apparel properties.
- Describe the factors affecting fabric and apparel properties.
- Test fabric properties and interpret results.
- Test apparels and accessories and interpret results.

Course Contents		
Unit I	**Introduction**	**01 Hours**

   a. Classification of fabric Properties.
   b. Sampling of Fabrics.

Unit II	**Dimensional Characteristics of Fabric**	**04 Hours**

   a. Determination of fabric length, width, thickness, thread density, thread count.
   b. **Determination of fabric weight:** Weight per unit length and weight per unit area.
   c. Determination of crimp of yarn in fabric, Effect of crimp on the fabric properties.
   d. **Determination of fabric cover:** Fractional cover factor, cloth cover factor.

Unit III	**Mechanical Properties of Fabric**	**10 Hours**

A. Fabric Strength
   a. **Terminology and definitions**
   b. **Tensile strength testing**: Raveled strip test, cut strip test, grab test, comparison of strip test & grab test, fabric behavior during tensile strength test.
   c. **Tear strength testing:** Elmendorf tearing strength tester, impact principle, ballistic test.
   d. **Bursting strength test.**

B. Abrasion Resistance of Fabric
   a. **Terminology and definitions:** Serviceability, wear, abrasion, etc.
   b. **Abrasion resistance test:** Martindale abrasion tester, Universal wear tester.
   c. Assessment of abrasion damage.

C. Pilling of Fabrics
   a. Terminology and definitions.
   b. Mechanism of pilling.
   c. ICI pill box tester.
   d. Factors responsible for pilling.

Unit IV	Aesthetic Properties of Fabric	05 Hours

A. Fabric Stiffness, Drape
   a. **Measurement of Stiffness:** Shirley stiffness tester, loop tests.
   b. **Measurement of Drape:** Drape meter.

B. Crease Resistance &Crease Recovery
   a. **Terminology and definitions:** Crease, crease recovery, crease resistance, wrinkle, etc.
   b. **Measurement of crease recovery**: Recovery angle and TBL method.

C. Luster
   a. Concept of luster.
   b. Measurement of luster.
   c. Effect of fabric construction on luster.

Unit V	Comfort Properties of Fabric	07 Hours

A. Air Permeability
   a. **Terminology and definitions:** Air permeability, air resistance, air porosity, etc.
   b. Testing of fabric air permeability.

B. Water-Fabric Relations
   a. **Terminology and definitions:** Water permeability, water repellency, waterproof, water resistance, etc.
   b. **Basic concepts:** Fabric wetting and water repellency.
   c. **Methods of measuring water repellency in fabrics:** Wetting time test, spray test, drop penetration test, hydrostatic head test.
   d. **Water vapour transmission:** Concept and measurement of moisture vapour transmission rate of fabric.

C. Fabric Hand
   a. Concept of fabric hand.
   b. Objective & subjective evaluation of textiles.
   c. Introduction to KAWABATA & FAST techniques.

Unit VI	Testing of Apparels and Accessories	12 Hours

   a. **Dimensional properties of apparel fabrics:** Relaxation shrinkage, felting shrinkage, Swelling shrinkage, Contraction.
   b. Determination of fabric stretch and recovery.
   c. Determination of Snagging tendency of fabric.
   d. **Sewability of fabrics:** Seam strength, Seam efficiency, Seam pucker, Seam slippage, Needle cutting /Yarn severance, Seam appearance.
   e. Determination of Bow and Skewness.
   f. Flammability tests for apparel grade fabric.
   g. **Testing of Accessories:** Fusible interlinings, Zippers, Elastic waistband, Sewing threads, Buttons, Snap pull strength.

References Books:

1   J. E. Booth, Principles of Textile Testing, CBS Publishers & Distributors, 1996. ISBN: 9788123905150.
2   B. P. Saville, Physical Testing of Textiles, Woodhead Publishing Series in Textiles, 1999. ISBN: 9781855733671.
3   Quality Management Handbook for the Apparel Industry, New Age International Private Limited, 2012, ISBN: 978-8122434286.
4   K. Amutha, A Practical Guide to Textile Testing (1st ed.), Woodhead Publishing India, 2016. ISBN: 9789385059070.
5   V. K. Kothari, Testing and Quality Management (1st ed.). IAFL Publications. 1999 ISBN: 9788190103305.
6   ASTM Book of Standards - Section 7 - Textiles (Vols 07.01-07.02), 2020. ISBN: 9781682216538

DKTES Textile and Engineering Institute, Ichalkaranji
Second Year B. Tech. Fashion Technology (Semester – IV)
TFP257:   TEXTILE ELECTRONICS LAB

Lab Scheme: Practicals: 02 Hrs/ Week	Credits 01	Evaluation Scheme: CIE: 50 Marks See: 50 Marks

List of Experiments

1	VI characteristics of semiconductor diode.
2	Half wave rectifier- without filter and with filter.
3	Full wave rectifier- without filter and with filter.
4	Reverse characteristics of zener diode.
5	Closed loop inverting amplifier using Op-amp 741.
6	Closed loop non-inverting amplifier using Op-amp 741.
7	AC power control using triac.
8	LDR characteristics.
9	Displacement measurement using LVDT.
10	Speed measurement using magnetic and photo-electric pickup.
11	Realization of digital gates.
12	Realization of flip-flops/ decoder.

Submission – Completed Journal.

DKTES Textile and Engineering Institute, Ichalkaranji
Second Year B. Tech. Fashion Technology (Semester – IV)
TFP258: TEXTILE CHEMICAL PROCESSING LAB

Lab Scheme: Practicals: 02 Hrs/ Week	Credits 01	Evaluation Scheme: CIE: 50 Marks

List of Experiments

1	Acid and enzymatic desizing of Cotton fabric
2	Batch wise alkaline scouring of cotton fabric and P/C blend
3	Peroxide bleaching of Cotton fabric
4	Mercerization of cotton hank
5	Dyeing of cotton with direct dye
6	Dyeing of cotton with reactive dye
7	Dyeing of 100% polyester with disperse dye by using HTHP beaker dyeing machine
8	Direct style of printing on cotton with reactive dye
9	Discharge and Resist style of printing on cotton with reactive dye
10	Direct and discharge style of printing on PET with disperse dye
11	Softening treatments on garment
12	Weight reduction of polyester

Submission – Completed Journal.

DKTES Textile and Engineering Institute, Ichalkaranji
Second Year B. Tech. Fashion Technology (Semester – IV)
TFP259: TEXTILE MANUFACTURING -IV LAB

Lab Scheme: Practicals: 02 Hrs/ Week	Credits 01	Evaluation Scheme: CIE: 50 Marks

List of Experiments

1	Study of modern automatic winding machine.
2	General study of projectile weaving machine.
3	General study of rigid and flexible rapier weaving machine.
4	General study of cop changing and shuttle changing automatic loom.
5	General study of dobby, drop box and jacquard.
6	General study of Airjet weaving machine.
7	Sample warping and weaving.
8	Study of Fabric inspection and importance.
9	Visit to Airjet weaving unit.
10	Visit to modern warping and sizing unit
11	Visit to shuttle-less weaving unit.
12	Visit to Circular weaving unit.

Submission – Completed Journal.

DKTES Textile and Engineering Institute, Ichalkaranji
Second Year B. Tech. Fashion Technology (Semester – IV)
TFP260: PATTERN ENGINEERING -II LAB

Lab Scheme: Practicals: 02 Hrs/ Week	Credits 01	Evaluation Scheme: CIE: 50 Marks SEE: 50 Marks

List of Experiments

1	Draft and stitch pattern for style line using basic block pattern
2	Draft and stitch pattern for any cowl using the basic front pattern block
3	Draft and stitch pattern for 6-gore flared skirt.
4	Draft and stitch pattern for godets
5	Grade a basic block of size 8 to size 6
6	Grade a skirt of size 12 to size 6
7	Draft and stitch torso foundation for dresses without waist line seam.
8	Adopt and stitch patterns for puff and raglan sleeve.
9	Prepare muslin fabric for draping and drape a basic bodice on the body form.
10	Prepare muslin fabric for draping and drape any skirt on the body form.
11	Drafting and stitching of any kids wear
12	Study of fabric manipulation techniques and stitch sample for anyone.

Submission – Completed Journal.

DKTES Textile and Engineering Institute, Ichalkaranji
Second Year B. Tech. Fashion Technology (Semester – IV)
TFP261:   TESTING OF TEXTILES AND APPARELS LAB

Lab Scheme: Practical: 02 Hrs./ Week	Credits 01	Evaluation Scheme: CIE: 50 Marks

List of Experiments

1	Determination of fabric tensile strength and elongation.
2	Determination of fabric tear strength.
3	Measurement of air permeability of fabric.
4	Determination of fabric stiffness.
5	Determination of fabric drape.
6	Determination of fabric crease recovery angle.
7	Assessment of abrasion resistance.
8	Assessment of pilling propensity.
9	Measurement of fabric stretch and recovery.
10	Seam strength testing.
11	Dimensional stability of woven and knitted fabrics.
12	Testing of zippers.

Submission – Completed Journal.

DKTES Textile and Engineering Institute, Ichalkaranji
Second Year B. Tech. Fashion Technology (Semester – IV)
ADL201: ENVIRONMENTAL STUDIES

Teaching Scheme: Tutorial: 02 Hrs / Week		Evaluation Scheme: SEE-: 70 Marks CIE (Project work) -: 30 Marks (Based on syllabus of Sem. III and Sem. IV)

Course Objectives:
- To recall fundamental physical and biological principles those govern natural processes.
- To state the importance of ecological balance for sustainable development.
- To describe the impacts of developmental activities and mitigation measures and to further understand the environmental policies and regulations.
- To identify the complex relationships between scientific approaches to environmental issues and political, social, economic, and ethical perspectives on the environment.

Course Outcomes:
At the end of the course, students will be able to
- Develop an understanding of different natural resources including renewable resources.
- Realize the importance of ecosystem and biodiversity for maintaining ecological balance.
- Aware of important acts and laws in respect of environment.
- Demonstrate critical thinking skills in relation to environmental affairs

Course Contents		
Unit IV	**Environmental Pollution**	**08 Hours**
	Definition: Causes, effects and control measures of: a) Air pollution, b) Water pollution, c) Soil pollution, d) Marine pollution, e) Noise pollution, f) Thermal pollution, g) Nuclear hazards • Solid waste Management: Causes, effects and control measures of urban and industrial wastes. • Role of an individual in prevention of pollution. • Pollution case studies • Disaster management: Floods, earthquake, cyclone and landslides. Tsunami.	
Unit V	**Social Issues and the Environment**	**09 Hours**
	From Unsustainable to Sustainable development; Urban problems related to energy; Water conservation, rain water harvesting, watershed management; Resettlement and rehabilitation of people; its problems and concerns; Environmental ethics: Issue and possible solutions; Climate change, Global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust; Wasteland reclamation; Consumerism and waste products.	
Unit VI	**Environmental Protection**	**10 Hours**
	Environment Protection Act.; Air (Prevention and Control of Pollution) Act.; Water (Prevention and control of Pollution) Act; Wildlife Protection Act; Forest Conservation Act; Population Growth and Human Health, Human Rights. ; Field Work--Visit to a local area to document environmental assets river/forest/grassland/hill/mountain or Visit to a local polluted site–urban/rural/Industrial/Agricultural or Study of common plants, insects, birds or Study of simple ecosystems-ponds, river, hill slopes, etc.	

References Books:
1. Clark R. S., Marine Pollution, Clanderson Press Oxford (TB) Pg No. 6.
2. Cunningham, W. P. Cooper, T. H. Gorhani, E. & Hepworth, M. T. 2001, Environmental Encyclopedia, Jaico Publ. House, Mumbai, 1196p.
3. De A. K., Environmental Chemistry, Wiley Eastern Ltd.

4. Down to Earth, Centre for Science and Environment ®
5. Gleick, H., 1993, Water in crisis, Pacific Institute for Studies in Dev., Environment & security. Stockholm Env. Institute. Oxford Univ. Press 473p.
6. Hawkins R. e., Encyclopedia of Indian Natural History, Bombay Natural History Society, Bombay