

STATE BOARD OF TECHNICAL EDUCATION, BIHAR**Scheme of Teaching and Examinations for****IVTH SEMESTER DIPLOMA IN FASHION AND CLOTHING TECHNOLOGY****(Effective from Session 2022-23 Batch)****THEORY**

Sr. No.	SUBJECTS	SUBJECT CODE	TEACHING SCHEME	EXAMINATION – SCHEME							Credits
			Periods per Week	Hours of Exam.	Teacher's Assessment (TA) Marks (A)	Class Test(CT) Marks (B)	End Semester Exam. (ESE) Marks (C)	Total Marks (A+B+C)	Pass Marks ESE	Pass Marks in the Subject	
1.	Advanced Pattern Making	2051401	03	03	10	20	70	100	28	40	03
2.	Knitted and Nonwoven Fabric Technology	2051402	03	03	10	20	70	100	28	40	03
3.	Textile Testing	2051403	03	03	10	20	70	100	28	40	03
4.	Garment Component Manufacturing	2051404	03	03	10	20	70	100	28	40	03
5.	Clothing Production, Machinery and Equipments	2051405	03	03	10	20	70	100	28	40	03
Total:-			15				350	500			15

PRACTICAL

Sr. No.	SUBJECTS	SUBJECT CODE	TEACHING SCHEME	EXAMINATION – SCHEME					Credits
			Periods per Week	Hours of Exam.	Practical		Total Marks	Pass Marks in the Subject	
					Internal (PA)	External (ESE)			
6.	Advanced Pattern Making Lab	2051406	02	03	07	18	25	10	01
7.	Textile Testing Lab	2051407	02	03	07	18	25	10	01
8.	Garment Component Manufacturing Lab.	2051408	04	03	15	35	50	20	02
9.	Design and Manufacturing of Women's Wear Lab.	2051409	04	03	15	35	50	20	02
Total:-							12	150	06

TERM WORK

Sr. No.	SUBJECTS	SUBJECT CODE	TEACHING SCHEME	EXAMINATION – SCHEME				Credits	
			Periods per week	Marks of Internal Examiner (PA)	Marks of External Examiner (ESE)	Total Marks	Pass Marks in the Subject		
10.	Clothing Production, Machinery and Equipment's	2051410	02	15	35	50	20	01	
11,	Course under Moocs / Swayam / Others	2051411	04	15	35	50	20	02	
Total:-							06	100	03
Total Periods per week Each of duration one Hours =							33	Total Marks = 750	24

ADVANCED PATTERN MAKING

Subject Code 2051401	Theory			No of Period in one session : 42			Credits 03
	No. of Periods Per Week			Full Marks			
	L	T	P/S	ESE	:	70	
	03	—	—	TA	:	10	
				CT	:	20	

Rationale: Pattern making is the heart of garment industry. The student should be able to develop pattern by following relevant process. Knowledge on human figure type and creation of pattern for customers plays vital role in fashion industry. Skills in pattern making by manipulating the basic pattern are to be developed in students through this course. Students should be able to apply the technique of draping and grading. Students should develop commercial pattern from the basic pattern.

Competency: The aim of this course is to help the student to attain the following industry identified competency through various teaching learning experiences:

* **Create different advance patterns using draping and drafting methods.**

Course Outcomes (COs):

The theory, practical experiences and relevant soft skills associated with this course are to be taught and implemented, so that the student demonstrates the following industry oriented COs associated with the above-mentioned competency:

1. Manipulate given patterns using principles of dart manipulation and contouring.
2. Develop paper patterns for kids, men and women.
3. Interpret the given human figures for proper apparel selection.
4. Apply draping principles to develop patterns for different figures.
5. Use grading techniques to develop different pattern sizes.

UNIT	CONTENTS (Theory)	Hrs	Marks
Unit-1	Dart Manipulation and Contouring 1.1. Dart terminology, types of Darts. 1.2. Dart manipulation techniques. 1.3. Conversion of dart into tucks, seams (style lines), pleats and gathers. 1.4. Contouring principle and guidelines. 1.5. Cowsls.	12	20
Unit-2	Pattern plot and manipulation for apparels 2.1. Drafting for kids wear- Romper, layered skirt with halter top. 2.2. Drafting for women's wear- off shoulder top, evening gown. 2.3. Owing with corset and fish tail skirt. 2.4. Drafting for men's wear- formal shirt, Sherwani, Jeans, S.B. coat.	06	10
Unit-3	Fitting Analysis 3.1. Fitting Principles 3.2. Fitting Analysis- Fitting problems associated with women's garments and their remedies. 3.3. Fitting problems associated with men's garments and their remedies. 3.4. Human Figure types- Tall and thin, short and stout, Oval figure, Rectangular figure, Triangular figure, Inverted Triangular figure, hourglass figure.	06	10
Unit-4	Draping 4.1. Draping Terminology. 4.2. Tools used for Draping. 4.3. Dress form and its parts. 4.4. Principles of Draping. 4.5. Draping material- selection, preparation. 4.6. Draping procedure for women's upper and lower garments.	06	10

Unit-5	Grading 5.1. Principles for Grading. 5.2. Methods of grading- Track and Nested. 5.3. Grading the basic Garment Components.	06	10
	Total	42	70

CO PO MAPPING:

Course code.CO number	CO Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
C20...401.1	Manipulate given patterns using principles of dart manipulation and contouring.									
C20...401.2	Develop paper patterns for kids, men and women.									
C20...401.3	Interpret the given human figures for proper apparel selection.									
C20...401.4	Apply draping principles to develop patterns for different figures.									
C20...401.5	Use grading techniques to develop different pattern sizes.									
C20...401 (Average)										

Enter correlation levels 1, 2 or 3 as :

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) If there is no correlation, Then put “-”

List of Recommended Books / Reference

S. No.	Title of Books	Author	Publication
1	Pattern making for fashion design.	Helen Joseph, Armstrong	Harper Collins, Publishers, LA, 2009. ISBN: 978-0060403324
2	Zarapkar System of Cutting	Zarapkar, K R	Sale Publishers, Bombay ISBN: 9788124301999
3	Metric Pattern Cutting for Women	Winifred Aldrich	Blackwell Science Ltd., London ISBN: 978-1405175678
4	Pattern Cutting Made Easy	Gillian Holman	Blackwell Science Ltd., London ISBN: 9781849940733
5	More Dress Pattern Designing	Natalie Bray	Blackwell Science Ltd., London ISBN: 978-0632065028

KNITTED AND NON-WOVEN FABRIC TECHNOLOGY

Subject Code 2051402	Theory			No of Period in one session : 42			Credits 03	
	No. of Periods Per Week			Full Marks				: 100
	L	T	P/S	ESE				: 70
	03	—	—	TA				: 10
				CT				: 20

Rationale: Knitting is a very efficient and versatile method of making fabric. The loop structure contributes outstanding elasticity and favorable properties in fabric, which expand the range of end uses in garment manufacturing with stability more like that of woven. This course is developed to use the basic principles of warp, weft and flat knitting in fabric production for apparel manufacturing along with the knowledge of non-woven fabrics to resolve the industrial problems.

Competency: The aim of this course is to help the student to attain the following industry identified competency through various teaching learning experiences:

*** Develop fabrics using different techniques other than woven.**

Course Outcomes (COs):

The theory, practical experiences and relevant soft skills associated with this course are to be taught and implemented, so that the student demonstrates the following industry oriented COs associated with the above-mentioned competency:

1. Use weft knitting principle to develop relevant knitted fabric.
2. Select relevant knitted fabrics by using physical properties of it.
3. Test the quality parameters of knitted fabric.
4. Use warp knitting principle to develop ornamented warp knitted fabric.
5. Use nonwoven fabric to develop relevant garment.

UNIT	CONTENTS (Theory)	Hrs	Marks
Unit-1	Knitting process 1.1 Various ways of fabric manufacture. 1.2 Principle of intermeshing of loops. 1.3 Basic terms of fabric: Course, Wales, Stitch Length, Needle Loop, shinker loop, Face Loop, Back loop, Course Length. 1.4 Classification: knitting. 1.5 Knitted and woven fabrics.	02	04
Unit-2	Weft knitting machines 2.1 Classification of weft knitting machine. 2.2 Single jersey machine - Loop structure, Principle of intermeshing, functions of cylinder, cams, needles, fabric spreader, features, stripper. 2.3 Rib machines: structure, principle of intermeshing, arrangement of needles and tricks, Cylinder / dial cam, features. 2.4 Interlock machine: structure, principle, arrangement of needles and cylinder trick, cam arrangement, features. Flat Knitting:- Passage, principle, procedure to develop the specified fabric by using V bed.	10	18

Unit-3	Weft Knitted fabrics 3.1 Classification of weft knitted fabrics. Single jersey/rib/interlock/ purl fabric- structure, properties, comparison between the single and double jersey, physical properties of the given fabric. 3.2 Principle stitches: knit, tuck, miss, purl, Loop, diagram of tuck and float stitch. Effect of tuck and float stitch on fabric property. 3.3 Concept of design, cam order, needle order. 3.4 Representation of fabric on paper, method of presentation, Illustrate relevant notation on paper for the given design of fabric, ornamentation of single, rib, interlock and purl fabrics: La-coste, cross tuck, satin, jersey blister, thick fleece, Milano rib, double pique, pique poplin, evermote, punto – d—roma, ottoman rib, texi pique. 3.5 Advanced fabric: Fleecey fabric, plush, jacquard.	10	14
Unit-4	Quality and production of knitted fabric 4.1 Weft knit fabric defects: Causes and Remedies. 4.2 Test for weft knit quality: calculation of Spirality, barre, course length, GSM, CPI and WPI, stitch length, yarn count, stretch memory. 4.3 Knitting machine production. 4.4 Fabric parameter: Stitch length, tightness factor, GSM calculation, density of fabric.	06	10
Unit-5	Warp Knitting machines and fabrics 5.1 Warp knitting – General, Loop structure of warp knit fabric. 5.2 Comparison between warp and weft knitting. 5.3 Elements of warp knitting machines- needle bar, sinker bar, pressure bar, latch wire, pattern drum, pattern wheel, and chain links, lapping movement. 5.4 Warp knitting: Fabric structure, representation of fabric, chain notation, Single bar, two bar fabrics. 5.5 Application of warp knit fabrics.	08	16
Unit-6	Non-woven 6.1 Non-woven: Concept, Classification, favorable Properties for Garment Productions. 6.2 Manufacturing process of Nonwoven Fabrics. 6.3 Dry Method, Bonding method and Needle Bonding methods of production. 6.4 Properties and uses.	06	08
	Total	42	70

CO PO MAPPING:

Course code.CO number	CO Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
C20...402.1	Use weft knitting principle to develop relevant knitted fabric.									
C20...402.2	Select relevant knitted fabrics by using physical properties of it.									
C20...402.3	Test the quality parameters of knitted fabric.									
C20...402.4	Use warp knitting principle to develop ornamented warp knitted fabric.									
C20...402.5	Use nonwoven fabric to develop relevant garment.									
C20...402 (Average)										

Enter correlation levels 1, 2 or 3 as :

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) If there is no correlation, Then put “-”

List of Recommended Books / Reference

Sr. No.	Title	Author	Publication
1	Knitting Technology	D.J. Spencer	Woodhead Publihing Ltd. - UK. 1996 ISBN: 9781855733336
2	Fundamentals and advances in Knitting technology	Sadan Chandra Roy	Woodhead Publication India Ltd. – New Delhi ISBN: 9789380308166
3	The Nonwovens	Gianni Tanchis	ITMA April 2008 Publication
4	Knitting Technology	D. B. Ajgaonkar	Universal Publishir Mumbai. 1998
5	Knitting Technology	Iyer & Mervinger	Om book Services New-Delhi. 2000

TEXTILE TESTING

Subject Code 2051403	Theory			No of Period in one session : 42			Credits 03
	No. of Periods Per Week			Full Marks			
	L	T	P/S	ESE	:	70	
	03	—	—	TA	:	10	
				CT	:	20	

Rationale: Ever-rising competition in fashion industry has given more importance to quality, waste reduction and cost effectiveness than ever before. Yarns being the base of fabrics, they need yarn properties affect the fabric properties and therefore the end usability. Thus it will help students in selection of suitable fabric. Fabric testing will also help in quality assurance, cost cutting, waste reduction and customer satisfaction in garment production.

Competency: The aim of this course is to help the student to attain the following industry identified competency through various teaching learning experiences:

*** Apply principles of yarn and fabric testing in selection of raw materials and quality assurance in garment manufacturing.**

Course Outcomes (COs):

The theory, practical experiences and relevant soft skills associated with this course are to be taught and implemented, so that the student demonstrates the following industry oriented COs associated with the above-mentioned competency:

1. Perform yarn testing.
2. Evaluate the given fabrics based on dimensional properties.
3. Evaluate the given fabrics for handle and comfort properties.
4. Rate the given fabrics based on tensile properties.
5. Rate the given fabrics based on fastness properties.
6. Evaluate serviceability of given fabric for specified end use.

UNIT	CONTENTS (Theory)	Hrs	Marks
Unit-1	Yarn Testing 1.1 Different systems of yarn numbering. (Direct, indirect): British count, Metric, Tex, Denier count 1.2 Determination of yarn count by taking accurate length and accurate weight with electronic balance. 1.3 Yarn twist: Definition, direction twist, effect of twist on yarn and fabric properties. 1.4 Measurement of yarn twist by, (i) Twist Contraction principle (ii) Twist and untwist principle 1.5 Yarn evenness: Concept, Types of variations in yarn (random and periodic), Expressions used for unevenness: U%, C.V. %, Imperfections. Effect of yarn unevenness on yarn and fabric properties.	08	14
Unit-2	Fabric sampling and Dimensional properties 2.1 Fabric Sampling Method. 2.2 Fabric Dimensional Properties: Fabric Length, Width, Thickness, Weight measurement. 2.3 Warp Count, Weft Count, and Threads/Unit length, Cover factor, Crimp in Warp and Weft. 2.4 Dimensional stability, Measurement of dimensional stability of fabric.	08	12
Unit-3	Fabric serviceability 3.1 Serviceability, wear and abrasion. 3.2 Measurement of wear and abrasion using Abrasion tester. 3.3 Pilling of fabric, factors responsible for pilling of fabric. 3.4 Measurement of pilling by ICI Pill box tester.	06	10

Unit-4	Fabric Comfort and Handle properties 4.1 Water and air relation to fabric: absorbency, Waterproof, shower proof and water repellent fabrics. Basic concept of wetting: contact angle. Measurement: Spray test, Hydrostatic water head test. 4.2 Air-permeability, Air resistance, Air-porosity, Measurements of air permeability, Factors affecting air permeability, fabric air relation. 4.3 Concept of T.I.V (Thermal Insulation Value). 4.4 Stiffness, handle and Drape of fabric: Measurement of drape, stiffness and handle, Crease recovery, measurement by crease recovery angle.	10	18
Unit-5	Tensile Strength Testing 5.1 Tensile Strength, load, elongation, Mass Stress, tenacity, work of rupture, elastic recovery. 5.2 Yarn Strength: Measurement of single yarn strength and Lea strength. Count Strength Product (CSP). 5.3 Fabric Strength: Sample size, principle. 5.4 Measurement of tensile strength, tearing strength and bursting strength.	05	08
Unit-6	Colour Fastness Testing 6.1 Gray Scale for Colour change. 6.2 Gray scale for Degree of staining. 6.3 Sample preparation for colour fastness test, Measurement of colour fastness test to rubbing, washing, light, perspiration and sublimation.	05	08
	Total	42	70

CO PO MAPPING:

Course code.CO number	CO Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
C20...403.1	Perform yarn testing.									
C20...403.2	Evaluate the given fabrics based on dimensional properties.									
C20...403.3	Evaluate the given fabrics for handle and comfort properties.									
C20...403.4	Rate the given fabrics based on tensile properties.									
C20...403.5	Rate the given fabrics based on fastness properties.									
C20...403.6	Evaluate serviceability of given fabric for specified end use.									
C20...403 (Average)										

Enter correlation levels 1, 2 or 3 as :

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) If there is no correlation, Then put “-”

List of Recommended Books / Reference

S. No.	Title of Books	Author	Publication
1	Physical Properties of Textile Fibres	Morton, W.E.; Hearle, J.W.	Woodhead Publishing, 2008 ISBN: 978-1-84569-200-9
2	Handbook of Textile Testing- part-1: Testing and grading of textile fibres.	-	SP 15-1: Published 1989; Bureau of Indian Standards (BIS)
3	Textile Testing: Physical, Chemical and Microscopical	Skinkle John H.	Chemical Publishing Co. Inc. (1940); ASIN: B001OMN6VS

4	Principles of Textile Testing	Booth, J. E.	CBS Publisher; New Delhi; 1996 ISBN 13: 9788123905150
5	Testing and Quality Management	Kothari, V.K.	IAFL, New Delhi 1999 ISBN: 9788190103305
6	Handbook of Textile Testing and Quality Control	Grover, E.B; Hamby, D.C.	Textile Book Publishers, 1960- Technology and Engineering the University of Michigan
7	Physical Testing of Textiles	Saville, B.P	Woodhead Publishing Cambridge, England, CRC Press 2002;ISBN: 0-8493-0568-3
8	Methods of Test: Fibre, Yarn and Fabric	-	CIRCOT, Mumbai
9	A Practical Guide to Textile Testing	Amutha, K.	Woodhead Publishing India, New Delhi,2016. ISBN: 978-93-85059-07-0
10	Textile Testing	Angappan	-

GARMENT COMPONENT MANUFACTURING

Subject Code 2051404	Theory			No of Period in one session : 42			Credits 03
	No. of Periods Per Week			Full Marks			
	L	T	P/S	ESE	:	70	
	03	—	—	TA	:	10	
			CT	:	20		

Rationale: Development of garment components is the first step toward entire garment manufacturing. The student should be able to develop modified garment components from the basic by following relevant process. Skills in garment component manufacturing are to be developed in students through this course. Modifications in garment components play vital role in terms of value addition in fashion industry. Student should be able to apply the knowledge of modification and manufacturing of different garment components.

Competency: The aim of this course is to help the student to attain the following industry identified competency through various teaching learning experiences:

- * Use relevant design principles in garment component manufacturing.

Course Outcomes (COs):

The theory, practical experiences and relevant soft skills associated with this course are to be taught and implemented, so that the student demonstrates the following industry oriented COs associated with the above-mentioned competency:

1. Construct different seam and stitch types.
2. Develop different modified plackets, pockets and cuff.
3. Construct garment component by applying principle of fullness.
4. Develop different classes of collars, necklines and sleeves.
5. Use different garment finishing and enclosure techniques in specific situations.

UNIT	CONTENTS (Theory)	Hrs	Marks
Unit-1	Sewing Thread- Seams and Stitches 1.1 Sewing Thread:-Types, construction, sewing thread quality, selection of sewing thread. Ticket number, packages. 1.2 Seams: - Definition, Types of seams, seam quality parameters, factors for seam selection, seam finishes. 1.3 Stitches: - Definition, stitch classes, Types, subclasses, stitch quality parameters, factors for selection of stitches. 1.4 Defects related to sewing threads and remedial measures.	06	12
Unit-2	Placket, Pocket and Cuff 2.1 Plackets : Types- regular, top stitched, edge stitched, concealed plackets, kurta placket, faced placket, continuous bound, diamond plackets, zipper placket. 2.2 Pockets: Types of pockets- patch pocket, with lining and flap, front hip, side seam pocket, slash pocket with flap, single lip, double lip. 2.3 Cuff- Making and attaching procedure.	10	14
Unit-3	Fullness in garment 3.1 Fullness : Definition and Types 3.2 Yokes: Definition, selection of yoke design, different styles of yoke. Simple yoke, yoke with or without fullness, midriff yokes, methods of attaching yokes. 3.3 Darts : single, double pointed darts. 3.4 Tucks: pin tucks, cross tuck, piped tuck, shell tucks, Comparison. 3.5 Pleats: knife pleats, box pleats, inverted box pleats, accordion pleats, kick pleats, Flare godets, gathers, shirring, Single & double frills, ruffles. Comparison, Methods of attachment for each.	12	18
Unit-4	Collar, Neckline and sleeve 4.1 Collars: Classification, full roll, flat roll, flat partial roll, convertible and non-convertible, shirt collar, sailor collar, Peter pan collar, scalloped collar, mandarin, shawl reverse, notch collar. Method of construction of various collars. 4.2 Neckline: Types of necklines. 4.3 Sleeves: Types of sleeves, plain, puffs or gathered, bell, Raglan, bishop, leg-o-mutton, Magyar sleeves, dolman, kimono. 4.4 Methods of construction of various sleeves.	10	14

Unit-5	Waistband, Hemming and Garment enclosure techniques 5.1 Waist Band: Types- One piece, two piece, elastic waist band, construction procedure. 5.2 Hemming Techniques: Definition, Selection of hem type, hemming techniques, machines for hemming. 5.3 Garment closure techniques: Application of Zippers, Velcro, Button hole and button, hook and eye. 5.4 Procedure of closure.	06	12
Total		42	70

CO PO MAPPING:

Course code.CO number	CO Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
C20...404.1	Construct different seam and stitch types.									
C20...404.2	Develop different modified plackets, pockets and cuff.									
C20...404.3	Construct garment component by applying principle of fullness.									
C20...404.4	Develop different classes of collars, necklines and sleeves.									
C20...404.5	Use different garment finishing and enclosure techniques in specific situations.									
C20...404 (Average)										

Enter correlation levels 1, 2 or 3 as :

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) If there is no correlation, Then put “-”

List of Recommended Books / Reference

S. No.	Title of Books	Author	Publication
1	The technology of clothing manufacture	Harold Carr and Barbara Latham	John Wiley & sons. 1994
2	Garment Technology for fashion designers	Cooklin Gerry	Blackwell Science Ltd, England, 1997. ISBN: 978-1-4051-9974-2.208
3	Step by step dress making course	Aitken Leila	BBC Books, England, 1992. ISBN: 9781409352617
4	Sewing for Apparel Industry	Shaeffer Claire	Pearson Publication, 2008 ISBN No. 13: 978-0131884434
5	Clothing construction	Evelyn A. Mansfield	Houghton miffin 1953
6	The Art of Sewing	Thomas (anna jacob)	UBS Publication distributor Ltd.

CLOTHING PRODUCTION, MACHINERY AND EQUIPMENTS

Subject Code 2051405	Theory			No of Period in one session : 42			Credits
	No. of Periods Per Week			Full Marks			
	L	T	P/S	ESE	:	100	
	03	—	—	TA	:	10	
				CT	:	20	

Rationale: The Garments manufacturing process require numerous machineries for their manufacture. Also certain super-specialized machineries are used in this filed. This subject introduces these machineries and uses, their assemblies & parts in detail. Student will learn the different process sequence steps in apparel industry and learn different sewing machine settings which will help them to overcome the problems in production of garments.

Competency: The aim of this course is to help the student to attain the following industry identified competency through various teaching learning experiences:

* Use different types of garment machinery for mass production.

Course Outcomes (COs):

The theory, practical experiences and relevant soft skills associated with this course are to be taught and implemented, so that the student demonstrates the following industry oriented COs associated with the above-mentioned competency:

1. Develop marker plan for given fabric width.
2. Use cutting machine to separate garment components.
3. Select suitable needle for given fabric and sewing machine.
4. Use relevant sewing machine for specified setting.
5. Use relevant work-aids and attachments for specified setting.
6. Use fusing and pressing equipment.

UNIT	CONTENTS (Theory)	Hrs	Marks
Unit-1	Marker Planning and Spreading 1.1 Process flow chart in apparel industry. 1.2 Marker planning:- Definition, manual and computerized marker planning, Types of marker (block, continuous, half garment, whole garment, single size, multiple size (sectional, interlocked, mixed size), Factors affecting efficiency of marker plan. 1.3 Spreading:- Definition, Types of spread (Single, multiple, stepped ply) and forms of spreading (One way, face to face and two way), Requirements for fabric spreading- methods (Manual, Spreading carriage, automatic spreading). 1.4 Types of fabric packages and importance of longer length fabric packages.	06	12
Unit-2	Cutting and Cutting tools 2.1 Introduction, Types and requirements of quality cutting. 2.2 Cutting tools - Portable knives (straight knife, round knife), Stationary knives (band knife, die cutting machine); Specialised Knives – Notchers, drills. 2.3 Advanced cutting techniques- laser cutting, ultrasonic cutting, water jet cutting. 2.4 Defects in cutting and their remedies.	10	16
Unit-3	Sewing Needles 3.1 Types and classification 3.2 Parts in needle 3.3 Functions of different parts in sewing needle. 3.4 Sewing Needle size- American and European needle numbering systems. 3.5 Selection criteria for sewing needles. 3.6 Defects due to faulty needles.	04	06
Unit-4	Sewing Machines 4.1 Single Needle Lock stitch Sewing machine (SNLS)- Threading Diagram, parts and their functions feed, tension, take up, pedal and other settings. 4.2 Over-lock machine – Classification, Threading Diagram, parts and functions, differential feed mechanism, Needle Height, Feed dog Height Angles, Position of upper and Lower Knife. 4.3 Flat lock machine – Threading Diagram, parts and functions. 4.4 Buttonhole and button stitch – Threading Diagram, parts and functions. 4.5 Feed of the arm - Threading Diagram, parts and functions. 4.6 Bar tack machine - Threading Diagram, parts and functions.	10	16

Unit-5	Work-aids and Attachment 5.1 Work-aids and attachments – definition and advantages. 5.2 Work-aids and attachments of sewing machine- Rollers, Guides, Folders, modified presser, feet, Hemmer. 5.3 Placket making, Pocket making attachments. 5.4 Collar turning machine.	06	10
Unit-6	Fusing and Pressing 6.1 Fusing: Concept, Objectives and Requirements; Types- Fabrics used and Resins; Methods of application of resin. Requirements – Time Temperature, Pressure; Equipment - iron, movable flat bed, conveyor fusing machine. 6.2 Pressing: Terms – Under Moulding, Top Pressing; Types – Dry, Steam, High Pressure Steam; Accessories – Ironing Board, Sleeve Board, Bucks; Equipment – Mechanical, vacuum press, steam air mixture, Steam tunnel.	06	10
	Total	42	70

CO PO MAPPING:

Course code.CO number	CO Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
C20...405.1	Develop marker plan for given fabric width.									
C20...405.2	Use cutting machine to separate garment components.									
C20...405.3	Select suitable needle for given fabric and sewing machine.									
C20...405.4	Use relevant sewing machine for specified setting.									
C20...405.5	Use relevant work-aids and attachments for specified setting.									
C20...405.6	Use fusing and pressing equipment.									
C20...405 (Average)										

Enter correlation levels 1, 2 or 3 as :

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) If there is no correlation, Then put “-”

List of Recommended Books / Reference

S. No.	Title of Books	Author	Publication
1	The technology of clothing manufacture	Harold Carr and Barbara Latham	John Wiley & sons. 1994
2	Sewing for Apparel Industry	Shaeffer Claire	Pearson Publication, 2008 ISBN No. 13: 978-0131884434
3	Stitches and Seams	R.M. Laing and Webster J.	Manchester, England. ISBN: 9781870812733
4	Sewing Lingerie	The Editors	Cy De cosse Incorporated (1991) ISBN 13: 9780865732605

ADVANCED PATTERN MAKING LAB

Subject Code 2051406	Practical			No of Period in one session : 28			Credits 01
	No. of Periods Per Week			Full Marks			
	L	T	P/S	Internal (PA)	:	07	
	—	—	02	External (ESE)	:	18	

Rationale: Pattern making is the heart of garment industry. The student should be able to develop pattern by following relevant process. Knowledge on human figure type and creation of pattern for customers plays vital role in fashion industry. Skills in pattern making by manipulating the basic pattern are to be developed in students through this course. Students should be able to apply the technique of draping and grading. Students should develop commercial pattern from the basic pattern.

Competency: The aim of this course is to help the student to attain the following industry identified competency through various teaching learning experiences:

*** Create different advance patterns using draping and drafting methods.**

Course Outcomes (COs):

The theory, practical experiences and relevant soft skills associated with this course are to be taught and implemented, so that the student demonstrates the following industry oriented COs associated with the above-mentioned competency:

1. Manipulate given patterns using principles of dart manipulation and contouring.
2. Develop paper patterns for kids, men and women.
3. Interpret the given human figures for proper apparel selection.
4. Apply draping principles to develop patterns for different figures.
5. Use grading techniques to develop different pattern sizes.

UNIT	CONTENTS (Practical)
Unit-1	1. Draft Children's Romper (1/4 th Scale) specified dummy measurement. * 2. Draft kids halter tops and layered skirt (1/4 th Scale) for specified dummy measurement.
Unit-2	3. Draft women's jump suit (1/4 th Scale) specified dummy measurement. 4. Adapt the given kameez block for empire cut dress (1/4 th Scale) for specified dummy measurement. 5. Draft a women's corset with princess line (1/4 th Scale) for specified dummy measurement.
Unit-3	6. Adapt the given Basic Skirt for fish tail skirt (1/4 th Scale). * 7. Draft the pattern for Men's Formal Shirt and Sleeve (1/4 th Scale) for specified dummy measurement. 8. Draft the pattern for Men's Jeans Block (1/4 th Scale) for specified dummy measurement. 9. Draft the pattern for Men's sherwani Block (1/4 th Scale) for specified dummy measurement. 10. Adapt the men's S,B. coat or D.B. coat (1/4 th Scale) for specified dummy measurement. 11. Drafting men's tee shirt with raglan sleeve (1/4 th Scale) for specified dummy measurement.
Unit-4	12. Draping of Basic bodice block for specified dummy. * 13. Draping of Basic sleeve and collar block for specified dummy. 14. Draping of Basic skirt block for specified dummy. 15. Draping of men's trouser block for specified dummy.
Unit-5	16. Grade the basic garment component for specified dummy. *

(* indicate Mandatory)

TEXTILE TESTING LAB

Subject Code 2051407	Practical			No of Period in one session : 28			Credits 01
	No. of Periods Per Week			Full Marks			
	L	T	P/S	Internal (PA)	:	07	
	—	—	02	External (ESE)	:	18	

Rationale: Ever-rising competition in fashion industry has given more importance to quality, waste reduction and cost effectiveness than ever before. Yarns being the base of fabrics, they need yarn properties affect the fabric properties and therefore the end usability. Thus it will help students in selection of suitable fabric. Fabric testing will also help in quality assurance, cost cutting, waste reduction and customer satisfaction in garment production.

Competency: The aim of this course is to help the student to attain the following industry identified competency through various teaching learning experiences:

* **Apply principles of yarn and fabric testing in selection of raw materials and quality assurance in garment manufacturing.**

Course Outcomes (COs):

The theory, practical experiences and relevant soft skills associated with this course are to be taught and implemented, so that the student demonstrates the following industry oriented COs associated with the above-mentioned competency:

1. Perform yarn testing.
2. Evaluate the given fabrics based on dimensional properties.
3. Evaluate the given fabrics for handle and comfort properties.
4. Rate the given fabrics based on tensile properties.
5. Rate the given fabrics based on fastness properties.
6. Evaluate serviceability of given fabric for specified end use.

UNIT	CONTENTS (Practical)
Unit-1	1. Use wrap reel to determine yarn count (Ne, Nm, Tex, Denier). 2. Use twist tester to determine twist in single and doubled yarn.
Unit-2	3. Use single yarn strength tester to determine breaking load and elongation of yarn. 4. Determination of lea strength & count strength product (CSP) of cotton yarn
Unit-3	5. Determine fabric dimensions (Thread count, thread per unit length, cover factor, fabric width, GSM and Thickness). 6. Determine shrinkage of fabric (Hot water and Hot Air).
Unit-4	7. Determine tensile strength of fabric by using tensile strength tester. 8. Determine tear and bursting strength of fabric. 9. Determine crease recovery angle by crease recovery tester.
Unit-5	10. Determine fabric stiffness using fabric stiffness tester. 11. Determine drape of fabric by using drape meter.
Unit-6	12. Assessment of abrasion resistance and pilling propensity of fabric. 13. Determine colour fastness to rubbing, washing. 14. Determine colour fastness to perspiration and light. 15. Test water absorbency, repellency of given samples.

GARMENT COMPONENT MANUFACTURING LAB

Subject Code 2051408	Practical			No of Period in one session : 60			Credits
	No. of Periods Per Week			Full Marks			
	L	T	P/S	Internal (PA)	:	15	
	—	—	04	External (ESE)	:	35	

Rationale: Development of garment components is the first step toward entire garment manufacturing. The student should be able to develop modified garment components from the basic by following relevant process. Skills in garment component manufacturing are to be developed in students through this course. Modifications in garment components play vital role in terms of value addition in fashion industry. Student should be able to apply the knowledge of modification and manufacturing of different garment components.

Competency: The aim of this course is to help the student to attain the following industry identified competency through various teaching learning experiences:

* Use relevant design principles in garment component manufacturing.

Course Outcomes (COs):

The theory, practical experiences and relevant soft skills associated with this course are to be taught and implemented, so that the student demonstrates the following industry oriented COs associated with the above-mentioned competency:

1. Construct different seam and stitch types.
2. Develop different modified plackets, pockets and cuff.
3. Construct garment component by applying principle of fullness.
4. Develop different classes of collars, necklines and sleeves.
5. Use different garment finishing and enclosure techniques in specific situations.

UNIT	CONTENTS (Practical)	Approx Hrs required
Unit-1	1. Develop different stitches and seam types.	04
Unit-2	2. Develop different plackets. 3. Develop different pockets. 4. Develop cuff and attach to the sleeve.	20
Unit-3	5. Stitch single and double dart. 6. Develop different tucks. 7. Develop different pleats. 8. Develop different collars. 9. Develop and finish different neckline. 10. Develop different sleeves.	12
Unit-4	8. Develop different collars. 9. Develop and finish different neckline. 10. Develop different sleeves.	20
Unit-5	11. Attach zipper as garment closure.	04
Total		60

DESIGN AND MANUFACTURING OF WOMEN'S WEAR LAB

Subject Code 2051409	Practical			No of Period in one session : 60			Credits
	No. of Periods Per Week			Full Marks			
	L	T	P/S	Internal (PA)	:	15	
	—	—	04	External (ESE)	:	35	

Rationale: Designing and quality garment production is major requirements of women's wear. Students will learn about various designer aspects after learning this course. They will be able to overcome practical problems in manufacturing of women's wear. They will be able to judge the costing components involved in women's wear. Students will learn brand positions and acceptance, design establishment and fashion cycle is required for one professional along with the knowledge of patterning.

Competency: The aim of this course is to help the student to attain the following industry identified competency through various teaching learning experiences:

*** Develop formal-wear, casual wear and inner-wear for women.**

Course Outcomes (COs):

The theory, practical experiences and relevant soft skills associated with this course are to be taught and implemented, so that the student demonstrates the following industry oriented COs associated with the above-mentioned competency:

1. Select the apparels for women's wear for end use.
2. Minimize fabric consumption for various widths of fabrics.
3. Use innovative trims.
4. Construct different types of women's wear.

CONTENTS (Practical):

1. Render any five design of salwar Kameez or Kurti. *
2. Prepare pattern for design of salwar Kameez or Kurti. *
3. Complete the sewing preparatory process by cutting the pattern. *
4. Construct the Salwar kameez or Kurti.
5. Render any five designs for basic formal trouser or formal skirt.*
6. Prepare pattern for selected design of formal trouser or formal skirt.
7. Cut the patterns and complete the sewing preparatory process. *
8. Construct the formal trouser or formal skirt.
9. Render any five designs for formal shirt. Prepare pattern for any one design from them.
10. Cut the patterns and complete the sewing preparatory process. *
11. Construct the formal shirt.
12. Render any five designs for designer casual lower. Prepare pattern for any one design from them.
13. Cut the patterns and complete the sewing preparatory process. *
14. Construct the designer casual lower.
15. Render any five designs for designer casual lower. Prepare pattern for any one design from them.
16. Cut the patterns and complete the sewing preparatory process for designer casual lower. *
17. Construct the designer blouse.
18. Render any five designs for one-piece dress. Prepare pattern for any one design from them.
19. Cut the patterns and complete the sewing preparatory process for one-piece dress. *
20. Construct the one-piece dress.
21. Render any five designs for casual knitted jacket. Prepare pattern for any one design from them.
20. Cut the patterns and complete the sewing preparatory process for casual knitted jacket.
23. Construct the casual knitted jacket. *

(* indicate Mandatory)

CLOTHING PRODUCTION, MACHINERY AND EQUIPMENTS

Subject Code 2051410	Term Work			No of Period in one session : 60			Credits 01
	No. of Periods Per Week			Full Marks			
	L	T	P/S	Internal (PA)	:	15	
	—	—	02	External (ESE)	:	35	

Rationale: The Garments manufacturing process require numerous machineries for their manufacture. Also certain super-specialized machineries are used in this filed. This subject introduces these machineries and uses, their assemblies & parts in detail. Student will learn the different process sequence steps in apparel industry and learn different sewing machine settings which will help them to overcome the problems in production of garments.

Competency: The aim of this course is to help the student to attain the following industry identified competency through various teaching learning experiences:

* Use different types of garment machinery for mass production.

Course Outcomes (COs):

The theory, practical experiences and relevant soft skills associated with this course are to be taught and implemented, so that the student demonstrates the following industry oriented COs associated with the above-mentioned competency:

1. Develop marker plan for given fabric width.
2. Use cutting machine to separate garment components.
3. Select suitable needle for given fabric and sewing machine.
4. Use relevant sewing machine for specified setting.
5. Use relevant work-aids and attachments for specified setting.
6. Use fusing and pressing equipment.

Content (Term Work)

1. Draft and duplicate patterns for men’s wear to prepare marker plan.
2. Prepare marker for men’s wear for given fabric width (1/4th scale).
3. Draft and duplicate patterns for women’s wear to prepare marker plan.
4. Prepare marker for women’s wear for given fabric width (1/4th scale).
5. Form layer of given fabric using equal spread method (manual) for given marking length.
6. Cut garment component in lay using round knife (Portable) cutting machine.
7. Cut garment component in lay using straight knife (Portable) cutting machine.
8. Demonstrate threading, selection and setting of needle using single needle lockstitch machine.
9. Demonstrate different SPI and other setting using single needle lockstitch machine.
10. Develop different seam lines using relevant work-aids.
11. Develop different seam lines using relevant attachments.
12. Demonstrate threading, selection and setting of needle, different SPI and other setting using 3-needle and 4-needle Over-lock machine.
13. Demonstrate threading, selection and setting of needle, different SPI and other setting using 5-needle Over- lock machine.
14. Demonstrate threading, selection and setting of needle using flat lock machine.
15. Demonstrate different SPI and other setting using flat lock machine.
16. Demonstrate threading, selection and setting of needle using feed of the arm machine.
17. Demonstrate different SPI and other setting using feed of the arm machine.
18. Demonstrate threading, selection and setting of needle using buttonhole machine.
19. Demonstrate different SPI and other setting using buttonhole machine.
20. Demonstrate threading, selection and setting of needle using button stitch machine.
21. Demonstrate different SPI and other setting using button stitch machine.
20. Demonstrate threading, selection and setting of needle using bar tack machine.
23. Demonstrate different SPI and other setting using bar tack machine.
24. Stitch a collar using collar turning machine.
25. Prepare collar using fusing machine.
26. Prepare plackets using fusing machine.
27. Finish given garment using hot iron.
28. Finish given garment using vacuum steam press.
29. Produce novel effects on given fabric using special purpose machine.

Course under Moocs / Swayam / Others

Subject Code 2051411	Term Work			No of Period in one session : 60			Credits
	No. of Periods Per Week			Full Marks			02
	L	T	P/S	Internal (PA)			
	—	—	02	External (ESE)			
				:		50	
				:		15	
				:		35	

