

ANNA UNIVERSITY, CHENNAI

AFFILIATED INSTITUTIONS

R - 2013

B.TECH. FASHION TECHNOLOGY
SEMESTER – V

CODE	COURSE TITLE	L	T	P	C
THEORY					
FT6501	Textile Chemical Processing – II	3	0	0	3
FT6502	Textile and Apparel Quality Evaluation	3	0	0	3
TT6503	Knitting Technology	3	0	0	3
FT6503	Garment Finishing and Clothing Care	3	0	0	3
FT6504	Apparel Production Planning and Control	3	0	0	3
FT6505	Pattern Engineering – II	3	0	0	3
PRACTICALS					
FT6511	Pattern Engineering Laboratory - II	0	0	3	2
FT6512	Textile Chemical Processing Laboratory	0	0	3	2
FT6513	Textile and Garment Testing Laboratory	0	0	3	2
TOTAL		18	0	9	24

FT6501

TEXTILE CHEMICAL PROCESSING II

L T P C
3 0 0 3

OBJECTIVES:

- To acquaint student with different types of textile finishing and its assessment
- Have knowledge of garment dyeing, printing and washing
- Have knowledge of dyes, auxiliaries and eco friendly chemical processes

UNIT I	13
Finishing - Calendaring, shrink proofing, antistatic finish, softening, water and flame proofing, UV protection, antimicrobial finish, resin finishing – crease recovery, wash and wear and durable press finishes	
UNIT II	5
Standard methods of assessment of all the above finishes	
UNIT III	9
Selection of garment accessories for garment dyeing; preparation of garments for dyeing; garment dyeing machines; physical finishes for garments.	
UNIT IV	9
Selection of dyes and auxiliaries for garment dyeing; printing machines for garments and unconventional printing techniques; washing of denim and other garments, laundering and stain removal.	
UNIT V	9
Eco friendly chemical processes, banned dyes and chemicals, evaluation techniques for assessment of these agents, permissible limits for objectionable agents.	

TOTAL : 45 PERIODS

OUTCOMES:

Upon completion of this course, the students will be able

- To develop thorough knowledge in textile and garment finishing.
- To sensitize the hazardous and banned dyes, chemical and auxiliaries
- To work in a textile wet processing industry

TEXTBOOKS:

1. Dr. V.A. Shenai, "Technology of Finishing", Vol. X, Usha, 1998
2. Marks Atlas & Wooding, "Chemical After Treatments of Textile", 1st ed., PHI, 1996
3. A.J. Hall, "Textile Finishing", 2nd ed., McGraw Hill, 1995.
4. J.T. Marsh, "Introduction to Textile Finishing" Vol. II, New Age, 1996

REFERENCES:

1. R.M. Mittal and S.S. Trivedi, "Chemical Processing of Polyester/Cellulosic Blends", 2nd ed., Tata McGraw Hill, 2000
2. Schindler W.D and Hauser P., "Chemical Finishing of Textiles"., Wood head Publications.
3. Bernard P. Corbman, "Textile Fibre to Fabric", McGraw Hill International Edition.
4. Reife A and Freeman H.S., "Environmental Chemistry of Dyes and Pigments", Wiley, 1996.

FT6502

TEXTILE AND APPAREL QUALITY EVALUATION

L T P C
3 0 0 3

OBJECTIVE:

To infuse understanding of yarn, fabric and apparel testing methods

UNIT I	SAMPLING TECHNIQUES	6
Definition – random- biased techniques for fibre, yarns and fabrics. Standard conditions - RH and temperature for testing. Moisture – measurement.		
UNIT II	YARN TESTING	12
Twist direction – Twist multipliers. Twist testers. Tension type – Take-up -ATIRA Direct type testers, Yarn Hairiness Testing - Methods – Optical – Singeing. Yarn count – Instruments – analytical balance – Knowles balance – quadrant balance – Beesley balance- electronic yarn count and yarn diameter. Methods of measuring evenness – Black board – ASTM standards –		

Cutting and weighing methods – Electronic capacitance – Uster evenness tester – Uster standards – Yarn faults – classification – Uster Classimat.

UNIT III FABRIC TESTING 9

Crimp – Influence on fabric properties – Shirley crimp tester, fabric tensile strength tester – ravelled strip method – grab methods. Elmendorf tear tester, Ballistic tester – Hydraulic bursting strength tester, Fabric abrasion resistance – handle- serviceability assessment, Martindale abrasion tester, Fabric pilling I.C.I Pillbox tester.

UNIT IV DRAPE MEASUREMENT 9

Fabrics drape measurement – Drape meter. Fabrics stiffness - Shirley stiffness tester, fabric crease resistance and crease recovery measurements. Fabric permeability - Shirley air permeability tester – Fabric water permeability tester – Friction measuring instruments.

UNIT V APPAREL TESTING 9

Seam strength testing – Seam severance testing. Evaluation of interlinings quality Colour fastness testing Apparel dimensional stability testing. Objective evaluation of fabric tailorability.

TOTAL : 45 PERIODS

OUTCOMES:

The student will have knowledge on

- Methods by which the physical and mechanical properties of textile materials and products are measured and investigated
- Sampling and yarn quality parameters testing
- Fabric and garment quality parameters testing

TEXTBOOKS:

1. Booth J.E., "Principle of Textile Testing", Butterworth Publications, London, 1989
2. Kothari V. K., "Testing and Quality Management", Progress in Textile Technology Vol.1, IAFL Publications, New Delhi, 1999
3. Sara J. Kadolph., "Quality Assurance for Textiles and Apparels", Fair Child Publications, New York, 1998

REFERENCES:

1. Saville,B.P. "Physical Testing of Textiles", Woodhead Publishing Ltd., England,2004.
2. Grover E G and Hamby D. S "Hand Book of Textile testing and quality Control", Wiley Eastern Pvt. Ltd., New Delhi, 1969.
3. Ruth clock and Grace Kunz., "Apparel Manufacture – Sewn Product Analysis", Upper Sadle River Publications, New York, 2000
4. Pradip V. Mehta., "Managing Quality in the Apparel Industry", NIFT Publication, India, 1998
5. Slater K., "Physical Testing and Quality Control", The Textile Institute, Vol.23, No.1/2/3 Manchester, 1993
6. Arindam Basu, "Textile Testing-Fiber, Yarn & Fabric", SITRA, India, 2001.

TT6503

KNITTING TECHNOLOGY

**L T P C
3 0 0 3**

OBJECTIVES:

To make the students to understand

- Fundamentals of knitting
- Types of knitting processes in detail
- Functioning of components of knitting machine

UNIT I INTRODUCTION 9

Reasons for the growth of the knitting industry. Comparisons of fabric properties - wovens, knits and bonded fabrics; classification of knitting processes – weft and warp knitting; yarn quality requirements for knitting. Preparation of staple yarns for weft and warp knitting.

UNIT II FUNDAMENTALS OF KNITTING 9

General definitions and principles of knitting; Types of knitting needles – bearded, latch & compound needle. Elements of knitted loop structure.

UNIT III WEFT KNITTING 9

Basic weft knitted structures and their production - plain, rib, interlock and purl; Fundamentals of formation of knit, tuck and float stitches; factors affecting the formation of loop; effect of loop length and shape on fabric properties; Analysis of various types of weft knitted structure. Weft knitted fabric geometry.

UNIT IV WEFT KNITTING MACHINES 9

Construction, Characteristics and working of circular knitting machines used for the production of basic structures; production of derivatives of weft knitted structures; needle control in circular knitting machines; quality control in knitted fabric production; production calculation. Basic principles and elements of flat knitting machines; different types of flat knitting machines - manual, mechanical and computer controlled; production of various weft knitted structures using flat knitting machines.

UNIT V WARP KNITTING 9

Basic principles; elements of warp knitted loop – open loop, closed loop; warp knitting elements-chain link, chain links for simple patterns, guide bar movement mechanism,. Tricot and Rachel warp knitting machines. Principles of double needle bar patterning, Terry pile fabric production. Let off system; run in value based on the lapping diagram; take up system; theoretical concepts of warp knitted loop configuration; Uses of warp knitted fabrics in technical applications.

TOTAL : 45 PERIODS

OUTCOMES:

Upon completion of this course, the student shall be able to understand the

- Principle of knitting by different types of knitting machines
- Structure and properties of fabric produced by different knitting machines

TEXTBOOKS:

1. Spencer D.J., "Knitting Technology", III Ed., Textile Institute, Manchester, 2001.
2. Ajgaonkar D.B., "Knitting Technology", Universal Publishing Corporation, Mumbai, 1998.

REFERENCES:

1. Chandrasekhar Iyer, Bernd Mammel and Wolfgang Schach., "Circular Knitting", Meisenbach GmbH, Bamberg, 1995.
2. Samuel Raz., "Flat Knitting: The new generation", Meisenbach GmbH, Bamberg, 1997.
3. Samuel Raz., "Warp Knitting production", Melliand Textilberichte, GmbH, Rohrbacher, 1987.
4. Gajjap B.J., "Handbook of warp Knitting Technology", Textile Institute, Manchester, 2004.
5. Thomas D.G.B., "An Introduction to Warp Knitting", Merrow Publishing Company, UK., 1971.
6. Sam Raz, "Warp Knitting Production", Melliand Textilberichte GmbH, Heidelberg, Germany, 1987.
7. Die Maschenbindungen der Kettenwirkerai, "An Introduction to the Stitch Formations in Warp Knitting", Published Employee's Association, Karl Mayere.V., Germany, 1966
8. Paling D.F., "Warp Knitting Technology", Columbine Press, U.K, 1966
9. Charles Reichman, "Wool and Synthetic Knitwear Handbook", National Knitted Outerwear Association, U.S.A, 1967
10. Charles Reichman, "Knitted Stretch Technology", National Knitted Outerwear Association, U.S.A, 1965

FT6503

GARMENT FINISHING AND CLOTHING CARE

L T P C
3 0 0 3

OBJECTIVES:

To educate the students in techniques and machinery for dyeing and finishing of garments and to impart knowledge on different garment care techniques.

UNIT I

9

Water –soft water –hard water – methods of softening water. Garment dyeing, dye selection, garment-dyeing machinery. Washing: Stone washing, acid washing, enzyme washing, bio polishing, mesmerisation, bleaching, laser fading and ozone fading.

UNIT II

9

Study of laundry equipment and reagents – soaps – detergents – cleaning action of soaps, study of modern and industrial cleaning agents. Finishing; Optical brightening, mercerization, liquid ammonia, treatment, stiffening, softening, crease resistant and crease retentive finish, anti-static finish, anti-bacterial finish, water proofing, flame proofing, soil release finish, mildew and moth proofing.

UNIT III

9

Study of garment finishing room equipments – steam iron – steam busters – vacuum ironing tables – form finishing equipments – trouser toppler, shirt press, collar/cuff press, form finisher for jackets and coats – study of boiler and related equipment for finishing room. Fusing machines for interlinings

UNIT IV

9

Principles of laundering – stain removal – various solvents for stain removing blood, tea, rust, oil/grease etc. – different methods of washing – application of friction by hand rubbing – scribing – tumble wash

UNIT V

9

Stain removal – Oil, colour matter, chemicals. Use of care labels and standards / norms for care labels. Garment laundering equipments and procedures. Study of different types of house hold/industrial washing machines- rotary –swirling – pressure – tumble wash etc

TOTAL: 45 PERIODS

OUTCOMES:

The students would have knowledge on

- Dyeing techniques for apparel
- Applying of different finishes on garments
- Machinery and equipments for garment care

TEXT BOOKS:

1. Dantiyagi S., "Fundamentals of Textile and their care", Oriental longmans Ltd, New Delhi, 1980.
2. Denlkar, "Household Textiles & laundry work", Atma Ram & Sons, Delhi, 1993.
3. Harrison. P (Editor), "Garment Dyeing: Ready to wear fashion from the dye house", The Textile Institute, U.K. 1988.
4. Noemia D' Souza., "Fabric Care", New Age International (P) Ltd. Publisher, Chennai, 1998.

REFERENCES:

1. Marsh, J.T., "An Introduction to Textile Finishing", Chapman and Hall Ltd., London, 1979.
2. Shenai, V.A., "Technology of Textile Finishing", Sevak Publications, Bombay, 1995.
3. Hall, A.J., "Textile Finishing" Elsevier Publishing Co. Ltd., 1986.

OBJECTIVES:

- To emphasis on the improved methods of material control in apparel production
- To acquaint student with quality concepts for implementing quality in apparel production

UNIT I

9

Control parameters and basic data of styles and generalised garment types, new program analysis, style wise design wise analysis on production parameters, product development and duplication. Concepts of concurrent engineering, reverse engineering, production planning and time and action calendar, steps between prototypes to approved sample-production sample, product data management and understanding specification sheets and effective communication.

UNIT II

9

Operation break down and production sequence, identification of bottle necks and critical area, operation wise machinery allocation, usage of special attachments and tools for operation simplifications, production grid and flow chart.

UNIT III

9

Cutting techniques, cutting room controls, lay lot planning, bundle distributions, modern methods in cut piece distribution and tracking different manufacturing systems, mass customisation and made to order manufacturing systems advantages disadvantages and control measures in sewing.

UNIT IV

9

Production planning -Production floor balancing, line balancing, allocation of man power, production set up planning for a shirt factory, production set up planning for a bottoms and jacket factory, production set up planning for a fully integrated apparel manufacturing plant, conveyor system and control parameters.

UNIT V

9

Quality control in product development, quality control in printing, embroidery, washing and other accessories, quality planning, preproduction meetings and quality procedures, production meetings, in line inspection, final inspection, rescreening conditions and final inspections. Packing - Ratio packing, solid packing, short shipment, excess shipment, calculation of volumetric weight, carton dimension other requirements.

TOTAL : 45 PERIODS

OUTCOME:

The course will enable students to practise better methods in apparel production and planning to take informed business decisions in the apparel industry

TEXTBOOKS:

1. Jacob Solinger, "Apparel Production Handbook", Reinhold Publications, 1998
2. Carr H and Latham B., "The Technology of Clothing Manufacturing", Blackwell Science, U.K.,1994
3. Ruth E. Glock, Grace I. Kunz, "Apparel Manufacturing, Sewn Product Analysis", Fourth Edition, Pearson Education.
4. Chuter A.J., "Introduction to Clothing Production Management", Blackwell Scientific Publications, Oxford 2001.

REFERENCES:

1. Laing R.M., Webster J, "Stitches & Seams", The Textile Institute, India, 1998
2. Shaeffer Claire, "Sewing for the Apparel Industry", Prentice Hall, New Jersey, 2001
3. Singer, "Sewing Lingerie", Cy DeCosse Incorporated, 1991
4. Patty Brown & Janett Rice, "Ready-To-Wear Apparel Analysis", Third Edition, Prentice- Hall Inc., New Jersey.

FT6505

PATTERN ENGINEERING II

**L T P C
3 0 0 3**

OBJECTIVE:

- To develop better understanding on pattern construction, grading and pattern alteration techniques to provide good fit

UNIT I PATTERNS FOR COLLARS AND SLEEVES 9

Collar classification and terms, basic shirt collar, Peter Pan collar, sailor collar, mandarin collar, built-up neck lines, Cowls, Sleeve cap, sleeve cuffs, puff, petal, lantern and leg-of-mutton sleeves.

UNIT II PATTERNS FOR POCKET, PLACKET AND FACINGS 6

Pocket classification, outside pockets, inserted pocket and side-seam pocket. Pointed, Slit opening and Wing collar plackets. Facing patterns for cutout necklines and armholes.

UNIT III FOUNDATIONS FOR TOPS AND BOTTOM WEAR 12

Basic shirt foundation-Front bodice draft, back bodice draft, sleeve draft, adding seam allowance and pattern information. Kimono, Raglan foundation. Pant foundation- front and back, waist band. Jean foundation, Pant derivatives, Pattern for princess line foundation, strapless princess bodice foundation.

UNIT IV PATTERN FOR KNITS, ACTION WEAR AND SWIMWEAR 9

Knit top foundations, Bodysuit foundations and variations. Swimwear-Maillot, bikini, little-boy, and full-figure swim foundations. Pattern for Bias-cut dresses. Jacket and Coat foundations.

UNIT V PATTERN ALTERATIONS AND GRADING 9

Pattern alteration for fit, Factors affecting the pattern making process. Grading process, grade rules, and types of grading system.

TOTAL : 45 PERIODS

OUTCOMES:

The course will enable the students to have knowledge on

- Need for basic foundation patterns
- Body suit foundation and its variations
- Different styles of collar and sleeve patterns
- Procedural illustrations to stimulate the creative imaginations of students

TEXTBOOKS:

1. Helen Joseph, Armstrong, "Patternmaking for Fashion Design", Pearson Education Pte. Ltd., 2005
2. Winifred Aldrich, "Metric Pattern Cutting for Children's Wear and Baby Wear", Blackwell Publishing, 2004

FT6511

PATTERN ENGINEERING LABORATORY – II

**L T P C
0 0 3 2**

OBJECTIVE:

To train the students in pattern engineering of garments

LIST OF EXPERIMENTS

Development of patterns using drafting method of pattern making

1. Women's formal, casual and party wears
2. Men's formal, casual and party wears.
3. Children's - uniforms, playtime wear and sleep suits.
4. Grading of patterns

Development of patterns using draping method of pattern making

1. Basic bodice – front and back
2. Bodice with dart variations

3. Gored, flared skirts, Jeans, jumpsuits
4. Sleeve's, collar (convertible, peter-pan collar, turtle neck collar, shawl collar).
5. Neckline cowl, side seam cowl, bias cowl.

TOTAL : 45 PERIODS

OUTCOMES:

Upon completion of this practical course, the students will be able to

- Develop patterns for women's, men's and children's garments
- Do grading of patterns
- Develop patterns for basic bodice, gored, flared skirts, jeans and jumpsuits

LIST OF EQUIPMENT FOR BATCH OF 30 STUDENTS

- Working surface – pattern making / cutting table (polished or laminated top)
- Fabric and paper scissors - 15 No.
- Rulers – 12" and 36" - 15 No.
- Tailor's square – 24" x 14" - 15 No.
- Curve rules – French curves, hip curves and vary form curve - 15 No.
- Pattern notcher, tracing wheel, awl - 5 No.
- Measuring tape - 30 No.
- Pattern weights - 10 No.
- Dress forms (Full and Half) – Kids, Children's, Women's and Men's - 3 Each

FT6512

TEXTILE CHEMICAL PROCESSING LABORATORY

**L T P C
0 0 3 2**

OBJECTIVE:

To train the students in pre treatment and wet processing of textile materials

LIST OF EXPERIMENTS

1. Desizing and scouring of cotton fabric.
2. Peroxide Bleaching of Cotton Yarn/Fabric.
3. Degumming of silk.
4. Identification of dyes
5. Dyeing of Cotton using Reactive dyes.
6. Dyeing of Cotton using Vat dye.
7. Dyeing of polyester using disperse dyes.
8. Dyeing of polyester and cotton blend
9. Determination of wash, light, perspiration and rubbing fastness of dyed fabrics.
10. Printing of cotton fabric by direct technique.
11. Determination of Whiteness and Yellowness index
12. Determination of K/S of dyed fabrics using Spectrophotometer
13. Water proof and Flame retardant finishing of cotton
14. Resin and softener finishes.
15. Antimicrobial Finish Evaluation

TOTAL : 45 PERIODS

OUTCOME:

Upon completing this practical course, the student would be able to desize, bleach, dye, print and finish the fabric with different types of chemicals and colourants

LIST OF EQUIPMENT FOR BATCH OF 30 STUDENTS

1. Stainless vats (500 ml)
2. Water bath, Thermometers
3. Stirrer
4. Steam ager
5. Pilot padding mangle
6. HTHP Beaker dyeing machine

7. Pilot curing chamber
8. Fastness tester for Washing, Light, Perspiration & Rubbing
9. Printing table
10. Spectrophotometer

FT6513 TEXTILE AND GARMENT TESTING LABORATORY

LT P C
0 0 3 2

OBJECTIVE:

To impart knowledge of fabric and garment quality parameters testing.

LIST OF EXPERIMENTS

Determination of

1. Fabric tensile, tear and bursting strength
2. Fabric flexural rigidity, bending modulus and drapability
3. Fabric crease and wrinkle recovery
4. Fabric abrasion and pilling resistance tests
5. Fabric air permeability
6. Fabric surface roughness and friction coefficient
7. Determination of seam strength and seam slippage
8. Determination of fabric shrinkage, washing and crocking fastness (knitted and woven)
9. Kawabata – fabric low stress mechanical properties
10. Zipper endurance, slider pull-off strength tests

OUTCOMES:

Upon completion the students will be able to

- Measure important characteristics of fabric and garment
- Interpret the results obtained during evaluation of fabrics

LIST OF EQUIPMENT FOR BATCH OF 30 STUDENTS

Equipments	No.
Fabric tensile strength tester	1
Fabric tearing strength tester	1
Fabric Thickness Tester	1
Fabric Stiffness Tester	1
Fabric Crease Recovery Tester	1
Fabric Bursting Strength Tester	1
Fabric Abrasion Resistance Tester	1
Fabric Pilling resistance tester	1
Wrinkle recovery tester	1
Fabric Crock meter	1
Fabric air permeability tester	1

Weighing balance	1
Fabric Drape meter	1
Kawabata Tester (Desirable)	1