RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA BHOPAL

Credit Based Grading System

Textile Technology, VII-Semester

TX- 7001 – Advance Yarn Manufacturing

UNIT-I Limitations of conventional methods of spinning, summer of different new spinning process and their possibilities and limitations;
Rotor spinning- Overview, objects, developments, principle and speed; Raw material requirements and preparation; Method of operation - opening unit, yarn formation, structure and aspects of rotor and its influence on yarn, yarn withdrawal and winding system, automation. Calculation related to twist, production etc. Yarn characteristics - structure and its difference wit ring spun yarn, brief idea about the end products; Production of fancy yarn/core spun yarn in rotor spinning.

UNIT-II Air Jet Spinning - Principle, raw material requirements, yarn characteristic and yarn structure, comparison with ring spun yarn, inter-relationships in spinning technology, end use of yarn.

UNIT-III Friction spinning - Principle, raw material requirements, yarn structure and its comparison with ring spun yarn, end uses of yarn.
Wrap spinning and False twist spinning - Operating principle, yarn structure.

ADVANCED YARN MANUFACTURE PRACTICAL
Detailed study of modern yarn manufacturing machines. Constructional details, setting and gauging, controls and change places. Calculations of speeds, production.

References:

1. The Textile Institute-Short Staple Spinning, Series-Kleiwn. (Vol.5)
2. Spinning - P.R.Lord
3. New Spinning Systems - R.V. Mahendra Gowda (NCUTE Pub.)
4. Handbook of yarn production, Peter R. Lord, Woodhead 2003
5. Spinning in 70's - P.R. Lord
6. Rotor Spinning-ATIRA
7. Cotton Spinning calculatious-Taggart.
8. Recent Advances in Spinning Technology - BTRA International Technical Conference Report
9. Yarn Production Theoretical Aspects, P Grosberg, C Iype, Woodhead 1999

List of Experiments (Please expand it):
1. Detailed study of Open End Spinning
2. Detailed study of friction spinning.
3. Detailed study of air-jet spinning
4. Detailed study of constructional details, setting and gauging, controls and change places
5. Calculations of speeds, drafts, production etc.

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Credit Based Grading System

Textile Technology, VII-Semester

TX- 7002 – Advance Fabric Manufacturing

Unit I Introduction: to different weft insertion systems on shuttle less weaving machines e.g., projectile, jet and rapier looms; Weft velocity curves and comparison of different weft insertion system, Beat-up mechanism of different shuttle less weaving machines; Control of picking energy on shuttle-less weaving machines.

Unit II Sulzer Projectile Loom, Rapier loom - different types, yarn transfer systems and their features, rapier head.

Unit III Jet loom - principles of air and water jet weft insertion, weft buckling and jet control. Different types of selvedges used in shuttleless weaving machines; Introduction to multiphase, triaxial, circular and narrow fabric weaving; Essential requirements of filament weaving.

Unit IV Power of picking, velocity and acceleration of picking element, energy consume, timings, drive to sley and healds, fabric quality on Sulzer Projectile, Rapier, Air jet and Water jet looms.

References:

1. Shuttleless Weaving - Dr. M. K. Talukdar
2. Principle of Weaving - Marks & Robinson
3. Textile Science & Technology Shuttleless Weaving Machines Oldrich, Talavasek & Vladimir Svaty
4. Modern Preparation and Weaving Machinery - A. Ormerod.
5. Hndbook of Weaving, Sabit Adanur, Ph. D.
6. Weaving Technology & Operation - A. Ormerod & Walter S. Sondhelm
7. Rapier Loom - WIRA
8. Filament Weaving NCUTE HRD Programme Coordinator Prof. P.A.Khatwani, Mr. S. S. Yardi,
9. Innovations in Weaving Machinery - (The Course of Loom Development) - Dr. Teruo Ishila
10. Modern Weaving Theory & Practice- R. B. Singh

List of Experiments (Please expand it):

ADVANCE FABRIC MANUFACTURE PRACTICAL

1. Detailed study of different shittleless weaving machines.
2. Suggested list of experiments:
3. Detailed study of different Projectile Loom
4. Detailed study of different Air Jet Loom
5. Detailed Study of different Rapier Loom
6. Detailed study of different Water Jet Loom
7. Detailed study of Circular Loom
8. Detailed study of Knitting Machine

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Credit Based Grading System

Textile Technology, VII-Semester

TX- 7003 – Textile Chemistry-II

Unit I Introduction to printing different methods and styles of printing on natural and synthetic fibre fabrics and blends. Detailed study of different types of printing machines e.g. block, flat screen, roller and rotary screen printing.
Different modern techniques of printing; paste preparation of different dyes, Advance development in printing machine operation; After treatment of different printing materials; Printing use in plastic materials.

Unit II Introduction to finishing of natural and man-made fiber fabrics; Classifications of various finishes, finishing materials - their chemistry and application; Mangles drying ranges, IR drying, stainr, calendars, raising and milling machines.

Unit III Permanent and semi permanent finishes, silicon softening, milling, crease resistant, anti shrink, water repellent, water proof, flame proofing, setting of synthetic fibre fabrics, antistatic and soil release finishes. Easy care finishing of cotton and polyester / cotton blends.

Unit IV Textile preservatives, miscellaneous finishings.

TEXTILE CHEMICAL PROCESSING PRACTICAL-II

Scouring and dyeing of silk, wool, polyester, polyamide and blends. Identification of dyestuffs from dyed samples. Determination of different fastness properties of dyed samples. Printing with different dyestuffs on cotton, silk and polyester.

References:
1. Technology of printing Vol. IV Shennai
2. Technology textile finishing Vol. X Shennai
3. Engg. of Textile Colouration C. Duck Worth
4. Textile Finishing W.S.Murphy
5. Printing on Textiles by direct and transfer technique R.W. Lee
6. Electronics Control for Textile Machines Hiren Joshi, Gouri Joshi (NCUTE Pub.)
7. A Glimpse of the Chemical Technology of Textile Fibres R.R. Chakraverty
8. Trouble shooting in wet processing : Acetate, Rayon/Lycocell and Spandex Blends, Dunes

List of Experiments (Please expand it):
1. Scouring and dyeing of silk
2. Scouring and dyeing of wool
3. Scouring and dyeing of polyester
4. Scouring and dyeing of polyamide and blends
5. Identification of dyestuff from dyed samples.
6. Determination of different fastness properties of dyed samples
7. Printing with different dyestuff on cotton, silk and polyester.

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Credit Based Grading System

Textile Technology, VII-Semester

Elective-III TX- 7004 (1) – Color Physics and computer color matching

Unit I Fundamentals of color science, what is colour, perception of color, color mixing laws confusion in color perception, meta-merism.

Unit II Color order system: Munsell system, color atlas system, CIE system, CIE tri-stimulus values, chromaticity co-ordinates , transform of the CIE system, Equation index for color spaces, whiteness assessment, yellowness index.

Unit III Optical theory for color matching: Reflectance curves of dyed specimens, Kubelka – Munk theory, application of K-M theory to textiles, Developments after K-M theory.

Unit IV Color measuring instruments: Principles of color measuring instruments, optical sensors signal processor, features of the available color instruments, selection of instrument and its utilization.

Unit V Color difference Pass/fail system and shade sorting: Color difference and chromaticity diagram, color difference equation, CIE color difference equations, Acceptability and perceptibility, modified color difference equations based on ABLAB. Pass/fail system, setting up tolerance limit.

References:

1. Instrumental Color Measurements & CA Color Matching for Textiles; H.S. Shah & .S. Gandhi
2. Color Physics for Industry – Roderick Mcdonald.
3. Computer Color Analysis – A.D. Sule
4. Color for Textiles – A user handbook – Wilfred Ingamells
5. Modern Concepts of Color and Appearance – Asim Kr. Roy Choudhary
6. The Theory of Coloration of Textiles – 2nd Edition – A. Johnson
7. Color Technology in the Textile Industry, 2nd Ed. Cairman, (P?B) AATCC

List of Experiments (Please expand it):

Recipe development, colour difference measurement, Pass fail analysis, Shade sorting, wash fastness, light fastness, crock fastness analysis.
Determination of purity of dye stuff.

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Credit Based Grading System

Textile Technology, VII-Semester

Elective-IV TX- 7005 (1) – Knitting technology

Unit I Introduction to knitting and its comparison with weaving. Weft Knitting classification, specification of various knitting machines, elements of machine knitting, needle gaiting, principle of operation of different single jersey and double jersey machines, knitting cycle, positive yarn feeder, production calculation.

Unit II Basic single jersey and double jersey structures and their derivatives, horizontal stripping
and plating, application of electronics and automation in knitting machines. Designing by different, mechanisms e.g. pattern wheel, pattern drum and jacquard.

Unit III Warp knitting - Introduction to warp knitting, working principle and patterning in Tricot and Raschel Machines, control of yarn feeding in warp knitting machines; requirement of yarn quality; parameters for knitting; quality control in knitting and dimensional stability of knitted structures.

References:

1. Knitting Technology Prof. D. B. Ajgaonkar
2. Knitting Technology - Spencer
3. Knitting Technology - Pitman
4. Knitted Clothing Technology Terry Brackenbury
5. Machine Knitted Fabrics Felting Techniques Janet Natney