



SARVAJANIK UNIVERSITY
Sarvajnik College of Engineering and
Technology
Bachelor of Engineering



B E III Textile Technology: Semester –VI

Subject Name: Advances in Textile Processing Subject Code: BTTT14605

Type of course: Professional Elective Course III

Prerequisite (if any): Basic Knowledge of Textile Processing, Different types of yarns and fabrics.

List of Courses where this course will be prerequisite:

Rationale: The subject covers recent advances in textile wet processing and finishing of textiles. The subject deals with various modern finishing techniques for various textile materials along with environmental effect. The processes lead to imparting various aesthetic and functional properties to fabric and also help in value addition.

Teaching and Examination Scheme:

| TEACHING SCHEME | | | | Theory Marks | | | Practical Marks | | Total |
|-----------------|---|---|---|--------------|-----|-----|-----------------|-----|-------|
| L | T | P | C | TEE | CA1 | CA2 | TEP | CA3 | |
| 3 | 0 | 2 | 4 | 60 | 25 | 15 | 30 | 20 | 150 |

CA1: Continuous Assessment (assignments/projects/open book tests/closed book tests CA2: Sincerity in attending classes/class tests/ timely submissions of assignments/self-learning attitude/solving advanced problems TEE: Term End Examination TEP: Term End Practical Exam (Performance and viva on practical skills learned in course) CA3: Regular submission of Lab work/Quality of work submitted/Active participation in lab sessions/viva on practical skills learned in course

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BSC: basic science course /ESC: Engineering Science Course /HSM: Humanities and management /PCC: Professional Core course /PEC: professional Elective course /OEC: Open Elective course/ MD: mandatory non-credit course



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Content:

| Sr. No. | Content | Total Hrs |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| 1 | Introduction to Textile processing and its importance. Flow chart of material for different wet processes for different types of fabrics. | 3 |
| 2 | Modern developments in Singeing, Shearing and Cropping techniques for different fabrics. | 4 |
| 3 | Modern developments in Desizing techniques like enzyme Desizing, environmental aspects of desizing process. | 4 |
| 4 | Recent developments in bleaching and mercerizing process. | 4 |
| 5 | Dyeing: Modern developments in yarns and fabric dyeing, Study of different types of dyes and modern developments in dyeing machines, Basic idea of Photochromatic and Thermochromic dyes, Catalyst and catalysis, Cross linking agents, Low liquor application, Plasma Dyeing, Ultrasonic, Microwave and Electrochemical dyeing, Dyeing of Denim Fabrics | 6 |
| 6 | Printing: Modern developments in Printing machines, Comparison between Conventional printing and modern printing, Important process parameters for printing on various types of fabrics. Cross linking agents Digital printing- Inkjet printing- drop on demand, Ink jet printing machines Printing inks, Sublimation transfer printing – paper printing, Dyes and inks | 6 |
| 7 | Modern Finishes : Introduction to modern finishing techniques, silicon softening, milling, crease resistant, anti shrink, etc. Control of formaldehyde release, Stiff and soft finishing, Emulsion softeners, Water proofing and water repellency and its evaluation, Water proof and breathable textiles, Soil repellency and soil release Fire retardant finish – Chemistry of flame retardancy- Evaluation of flame retardancy, Anti microbial finishing Modern methods of finishing of wool, silk | 8 |

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| | | |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| | Bio polishing of Denim, Silk, Wool etc. Modern methods of finishing of synthetic fibers, setting of synthetic fiber & fabrics, antistatic finishes Industrial Denim washing, Processing of Garments Design development finishing machines - Mangles, Drying ranges, Infra red drying, stenter, calendars, raising and milling machines. | |
| 8 | Emerging Technologies in Wet processing – Nano technology, Microencapsulation, Plasma technology and its application in Technical textiles | 6 |
| 9 | Importance of Pollution control in Textile wet Processing, New developments in wet processing to reduce pollution | 4 |
| | | 45 |

Suggested Specification table with Marks (Theory):

| Distribution of Theory Marks | | | | | |
|-------------------------------------|-----------|-----------|----------|----------|----------|
| R Level | U Level | A Level | N Level | E Level | C Level |
| 20 | 15 | 10 | 5 | 5 | 5 |

Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create and above Levels (Revised Bloom’s Taxonomy)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Reference Books:

| Sr No | Title of book /article | Author(s) | Publisher and details like ISBN | Year of publication | Publication Edition |
|----------|-------------------------------------------------------|-------------|---------------------------------|---------------------|---------------------|
| 1 | Bleaching, Mercerising and Dyeing of Cotton Materials | Prayag, R.S | Pune | 1996,2000 | 3rd |

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|---|----------------------------------------------------------------------------------------|---------------|-----------------------------------------------------------------------------------|-----------|-----|
| 2 | Textile Finishing | Murphy, W. S. | Abhishek Publications, Chandigadh | 2003,2007 | |
| 3 | Technology of Textile Processing Vol. - II: Chemistry of Dyes and Principles of Dyeing | Shenai V.A. | Sevak pubs, Mumbai | 1997 | |
| 4 | Technology of Textile Processing Vol.-3: Technology of Bleaching and Mercerising | Shenai V.A. | Sevak pubs, Mumbai | 1996 | |
| 5 | Technology Of Textile Processing Vol.-4: Technology of Printing | Shenai V.A. | Sevak pubs, Mumbai | 1996 | 3rd |
| 6 | A Novel Green Treatment for Textiles Plasma Treatment as a Sustainable Technology | Chi-wai Kan | CRC Pres, Taylor & Francis, London, Newyork ISBN-9781439839447, 1439839441 | 2014 | |
| 7 | Pollution Control in Textile Industry | Bhatia S.C. | Woodhead Pub.Ltd , India ISBN - 978-93-85059-22-3 | 2017 | |

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|-----------|------------------------------------------------------|-------------------------------------------------|-----------------------------------------------------------|------|--|
| 8 | Nanotechnology in Textiles Theory and Application | Rajesh Mishra, Jiri Militky | Elsevier Science ISBN - 9780081026274, 0081026277 | 2018 | |
| 9 | Denim-A fabric for All: Dyeing, Weaving Finishing. | Parmar M.S | NITRA , Ghaziabad | 1996 | |
| 10 | Nano materials in the wet processing of the textiles | Shahid Ul-Islam (Editor), B. S. Butola (Editor) | Scrivener Publications (Wiley) ISBN-978-1-119-45984-2. | 2018 | |

Course Outcomes:

| Sr. No. | CO statement | Marks % weightage |
|---------|----------------------------------------------------------------------------------------------------------|-------------------|
| CO-1 | Study advances in textile wet processing and modern developments in machines used for wet processing. | 15 |
| CO-2 | Study of modern developments in Singeing, Shearing and Cropping, desizing and mercerizing process | 25 |
| CO-3 | Study of modern developments in dyeing and printing – Dyes, chemicals, inks and modern methods | 25 |
| CO-4 | Application of various types of finishes to fabrics for different applications | 20 |
| CO-5 | Study recent developments, Control of pollution due textile wet processing and its environmental impact. | 15 |

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Mapping with POs:

| | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 | PS O1 | PS O2 | PS O3 |
|------------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|
| CO-1 | 3 | 2 | 2 | 1 | 1 | 2 | 1 | 1 | 0 | 0 | 1 | 1 | 2 | 3 | 2 |
| CO-2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 3 | 3 | 2 |
| CO-3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 1 | 1 | 1 | 1 | 2 | 3 | 3 | 3 |
| CO-4 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 |
| CO-5 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 |
| Rationale* | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 1 | 2 | 1 | 2 | 3 | 3 | 3 |

Rationale*:

Study of advances in Textile wet processing helps in design development of variety of textile products. It also helps a lot in applying various finishes for Technical Textiles. Moreover it has a huge impact on environment. Study of this subject helps significantly in achieving Program outcomes.

List of Open learning website: Websites of Textile wet processing machine manufacturer

List of Open Source Software: <https://nptel.ac.in>

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FOR LAB SESSIONS:

List of Experiments:

1. Study of modern Desizing techniques
2. Study of Modern Dyeing machines
3. Study of Modern Printing machines and Techniques
4. Study of Denim Finishing
5. Develop water proof fabric.
6. Develop soil resistant fabric
7. Develop fire resistant fabric
8. Develop crease resistant fabric
9. Study of finishing using Nano technology,
10. Study of Microencapsulation Technique
11. Study of Plasma technology
12. Modern Testing methods for color fastness.

Major Equipment Needed:

Modern Dyeing and printing machines, High temperature steamer, Modern stenter, Water heating bath, Kier, Padding Mangle, HTHP beaker dyeing machine, Oven, Colour fastness tester etc.

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