

Textile chemical Processing: Theory and practice of Preparatory Processes - Web course

COURSE OUTLINE

Natural and added impurities in textiles. Natural impurities in cotton, wool and silk. Chemistry of sizing agents. Singeing, desizing, scouring, bleaching, mercerization and optical whitening of cotton.

Hydrolytic and oxidative desizing, Enzymatic desizing, Mechanism of removal of soil, Surfactants and their application.

Conventional and solvent scouring of cotton, enzymatic scouring, Bleaching with oxidative bleaching agents, Mercerization of cotton with sodium hydroxide and liquid ammonia, Chemistry and application of Optical whitening agents, Combined preparatory processes.

Carbonization, scouring and bleaching of wool, degumming and bleaching of silk. Preparation of synthetic fibres and blends, heat setting. Machinery for preparation of textiles.

COURSE DETAIL

Module No.	Name of the module	Contents	No. of Hours
1	Introduction	Natural and added impurities in textiles . Natural impurities in cotton, wool and silk. Oils and lubricants. Chemistry of sizing agents. Natural and synthetic sizes. Process sequence in chemical wet processing, Singeing, desizing, scouring, bleaching, mercerisation and optical whitening of cotton.	4
2	Singeing and Desizing	Singeing of different kind of fabrics. Hydrolytic and oxidative desizing, Enzymatic desizing.	3
3	Scouring	Mechanism of hydrophobic soil removal, Surfactants and their application. Conventional and solvent. Scouring of cotton, enzymatic scouring, Assessment of scouring efficiency.	5



NP-TEL

NPTEL

<http://nptel.iitm.ac.in>

Textile Engineering

Pre-requisites:

Physics, Chemistry, Mathematics, Introduction to textiles, Textile fibres.

Additional Reading:

1. Chemistry and Technology of Fabric Preparation and Finishing, C Tomasino, Department of Textile Engineering, Chemistry and Science College of Textiles, NCSU.
2. Colorants and Auxiliaries- Organic Chemistry and Application Properties, Volume-2 Auxiliaries, John Shore, 1990, JSDC.
3. Detergents and Cleaners-A handbook for formulators, KR Lange.

Coordinators:

Dr. B S Butola
Department of Textile Technology IIT Delhi

4	Bleaching	Bleaching with oxidative bleaching agents. Use of sod. Hypochlorite, hydrogen peroxide, sod. Chlorite, peracetic acid. Assessment of bleaching efficiency.	4
5	Mercerization	Mercerization of cotton with sodium hydroxide and liquid ammonia, process parameters, effect on fibre structure and properties.	4
6	Optical whitening agents	Chemistry and application of Optical whitening agents, Mechanism of action.	2
7	Combined preparatory processes	Need for combined processes. Combined scouring and desizing, Combined scouring and bleaching, Combined desizing, scouring and bleaching.	2
8	Pretreatment of protein fibres	Carbonization and scouring of wool. Oxidative and reductive bleaching of wool, Degumming and bleaching of silk.	4
9	Preparation of synthetic fibres and blends	Scouring of synthetic fibre fabrics and blends. Bleaching of synthetic fibre fabrics and blends.	2
10	Fibre degradation during pretreatment processes	Degradation of cotton during desizing, scouring and bleaching. Damage to wool during pre-treatment processes. Damage to silk during pre-treatment processes. Damage to polyester pre-treatment processes.	4
11	Heat setting	Introduction. Physics of heat-setting. Heat-setting and structural parameters. Mechanisms of heat-setting. Heat setting behaviour synthetic fibres, Methods of heat-setting, Effect of heat-setting on properties of synthetic fibres, settability and the measurement of the degree of set.	3
12	Machinery for preparation of textiles	Machinery for batch, semi-continuous and continuous processes.	3

References:

1. Chemical Technology in the pre-treatment process of textiles, S R Karmakar, 1999, Elsevier Science.
2. Textile Scouring & Bleaching by E.R.Trotman, B.I.Publications, New Delhi.
3. Handbook of Fibre Science and Technology- Volume I: Chemical Properties of fibers and fabrics fundamentals and preparation Part-A and B. ed. Mena Chem Lewin and Stephen B-Sello. Marcel Dekker Inc. New York.
4. Textile Preparation and Dyeing, A K R Choudhury, 2006, Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi.