

Department of Fibres and Textile Processing Technology

Syllabus for Ph. D. Tech. in Fibres and Textile Processing Technology Entrance examination (2024-2025)

Polymers and Fibres: Fibre forming polymers and their properties, Primary and secondary properties of fibres, Classification of fibres, Natural fibres and their properties, Synthetic Fibres, their synthesis and properties, Surface and overall Chemical and Physical modification of fibres, Grafting of different polymers on fibres and properties of grafted co-polymers, Reaction of various chemicals and radiations which alter the structural properties of fibres, Thermal modification, swelling of fibres, micro denier fibres, Recent trends governing the fibre modifications, Identification of fibres, superabsorbants.

Pretreatments: Desizing, scouring and bleaching of natural and synthetic fibres/fabrics, Oxidative and reductive bleaching agents, Hypochlorite and Hydrogen peroxide bleaching, Ecofriendly pretreatment processes, Continuous and combined pretreatment processes & Machinery, Chemistry of auxiliaries for processing, Pretreatment norms and their evaluation.

Colouration : Classification of colourants, Dyestuffs for natural and synthetic fibre/fabric and their application processes, Natural dyes and their application, Various dyeing machineries, Latest dyeing machines and dyeing techniques, Quantitative treatment for kinetics as well as equilibrium dyeing, State of dye in solutions and in fibre and dye-fibre interactions, Computer Colour Matching application, Basics of Printing of textiles, Ingredients of Print paste formulations and their relevance, Styles of printing, Methods of printing, Fixation of prints, Latest printing machines and printing techniques.

Finishing: Finishing of textiles, Chemical & Mechanical finishes, Speciality/Functional finishes, Application processes of finishing agents and their testing.

Testing: Physical/Mechanical testing of fibre/fabric, Wet fastness properties of dyed and printed textiles, working principle of FTIR, DSC, DTG, XRD etc and its application in textile analysis, Global test methods like ASTM, AATCC, ISO, etc, Testing of textile auxiliaries, Standard equipments to be used for testing of textile, parameters of importance, Methods for evaluation of auxiliaries as well as for their effectiveness or activity.

Garment processing: Garment desizing, Manufacturing, Garment processing, recent trends in garment processing

Technical textiles: Definition & Classification of Technical Textiles, Economics, Growth Potential, Selection Criteria for the fibres to be used in individual fields, Hi-Tech fibres & its application, Nonwoven textiles, Application of Textiles in 12 sectors of technical textiles such as transport, defense, construction, medical, agriculture, recent advances in the field of technical textiles etc.

Biotechnology in Textiles: Application of different enzymes in various areas of Textiles: Bioscouring, Biodesizing, Biopolishing, silk degumming, effluent treatment, Biodegradable Fibres: Concept, Different Fibres used and their Biodegradability study, Areas of applications

Environmental aspects of Textile Processing : Discharges from textile processing industry, its characteristics and treatment, Banned dyes, Red listed chemicals and their Ecofriendly substitutes, WTO, GATT, quality certification, international trade practices, etc, Water/Energy consumption in the industry, Processes for energy & Water conservation e.g. E-Control, Hot Mercerization, Supercritical Carbon Dioxide (CO₂) Dyeing Technique, LBL technique etc, Right First Time Approach, Consequence of water/Energy conservation.