

GUJARAT TECHNOLOGICAL UNIVERSITY

B.E. SEMESTER : VIII

TEXTILE TECHNOLOGY

Subject Name: **MODERN FIBRE TECHNOLOGY**

Sr. No.	Course Contents	Total Hrs
1.	Definition and classification of manufactured fibres. Fibre forming process, products, properties and application areas.	02
2.	Structural principles of polymeric fibres, molecular size and interaction, polymers as fibres, plastics and rubbers, fibre morphology, thermal transition.	03
3.	Melt spinning process, melt spinning line, extruder, cooling system, etc. Melt spinning variables and condition for continuous spinning. Special features of high speed spinning, critical parameters. Structural formation during spinning.	06
4.	Solution spinning process, dry spinning rheology, spinning cell, fibre cross section formation, etc. Wet spinning solution, preparation and transport coaguration. Development of structure and morphology during solution spinning.	06
5.	Spin finish: - Properties and role of spin finish, components, and application techniques. Spin finish for staple fibre production and for filament yarn.	04
6.	Heat setting, nature of set- temporary and permanent. Heat setting of polyamide, polyester and cellulose acetate.	04
7.	Characterization of polymers at molecular level – number average and weighted average molecular weight. Polyester dispersity, etc. Determination of molecular weight like osmometry, light scattering, viscometry, GPC. Physical structure, density measurement, SAXS, IR spectrometer, FTIR, ATR, infrared dichroism. Thermal characterization like DSC, DTG, TMA, etc. Microscopic characterization like light microscopy, TEM, SEM.	05
8.	Speciality polyamide and polyester like modified nylon and polyester. Antistatic nylon and polyester, flame retardant yarn, PET with microgrooves, microvoids and microcraters, super micro filament, fibres with non circular cross section and hollow fibre.	05
9.	Rayon fibres – spinning with modifiers, tyre yarn, high weight modulus yarn. Variant like high performance crimp, inflated fibres – super absorbent, flame retardant, etc. Process, properties and application of lyocell fibre.	05
10.	High performance fibre – fibres with average, above average and superior mechanical properties. Aramid fibres like Nomax, Kevlar etc. Aeromatic polyester, carbon fibres – production, surface treatment, structure and morphology, properties and application of carbon fibre. Glass fibre – structure, properties and application.	05

Text Books

Sr. No.	Title	Author
1.	Manufacture fibre technology	V. B. Gupta and V. K. Kothari

References

Sr. No.	Title	Author
1.	Production of synthetic fibre	A. A. Vaidhya