

Nonwoven Technology - Web course

COURSE OUTLINE

Overview of nonwovens: Definition, Structure, and Creation, Staple-fibre based processes: fibre preparation and web formation, Web bonding processes: Mechanical Thermal, and Chemical, Polymer-extrusion based technologies: Spunbond and Meltblown, Finishing processes: Mechanical and chemical.

COURSE DETAIL

S.No	Modules	No. of Hours
1	Module 1: Overview of nonwovens	9
	Chapter 1.1: Nonwovens: What are they? Definitions of nonwovens.	1
	Chapter 1.2: Nonwovens: How do they look like? Elements of nonwovens, Fibre geometry, Structure of fibrous webs.	6
	Chapter 1.3: Nonwovens: How are they created? Basic nonwoven processes and their sequences.	2
2	Module 2: Staple-fibre based	9



NP-TEL

NPTEL

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

Textile Engineering

Pre-requisites:

Physics, Chemistry, Mathematics, General Understanding of Textile Technology, Textile Fibres

Additional Reading:

1. A.T. Purdy, Needle-punching, Textile Progress (3), 1980.
2. R.K. Dharmadhikary et al. Thermal Bonding of Nonwoven Fabrics, Textile Progress (2), 1995.

Hyperlinks:

1. www.nonwovens.com
2. www.edana.org
3. www.inda.org

Coordinators:

	processes	
	Chapter 2.1: Staple fibre preparation processes Raw materials, Fibre opening and mixing processes.	2
	Chapter 2.2: Staple fibre web formation processes Carding process, Parallel-lay process, Cross-lay process, Perpendicular-lay process, Air-lay process, Wet-lay process.	7
3	Module 3: Web bonding processes	10
	Chapter 3.1: Mechanical bonding processes Needle-punch process and Hydroentanglement process.	4
	Chapter 3.2: Thermal bonding processes Principles of thermal bonding, Calender bonding process, Through-air bonding process, Infra-red bonding process, Ultrasonic bonding process.	3
	Chapter 3.3: Chemical bonding processes Chemical binders, Methods of binder applications, Saturation bonding process, Foam bonding process, Spray bonding process, Print bonding process, Methods of drying.	3
4	Module 4: Polymer-extrusion based technologies	6
	Chapter 4.1: Spunbond technology	3

	Raw materials, Process sequence, Machine elements, Commercial systems, Key process factors.	
	Chapter 4.2: Meltblown technology Raw materials, Process sequence, Machine elements, Commercial systems, Key process factors.	3
5	Module 5: Finishing processes	6
	Chapter 5.1: Mechanical finishing Mechanical finishes and Methods of applying mechanical finishes.	3
	Chapter 5.2: Chemical finishing Chemical finishes and Methods of applying chemical finishes.	3

References:

1. S.J. Russell (Ed.), Handbook of Nonwovens, Woodhead Publishing, CRC Press, Washington DC, 2007.
2. W. Albrecht, H. Fuchs and W.Kettelmann, Nonwoven Fabrics: Raw Materials, Manufacture, Applications, Characteristics, Testing Process, Wiley-VCH, Verlag GmbH & Co. KGaA, Weinheim, 2003.
3. M.S. Casper, Nonwoven Textiles, Noyes Data Corp. (Park Ridge, N.J), 1975.
4. M. McDonald, Nonwoven Fabric Technology, Park Ridge, NJ: Noyes Data, 1971.