

Textile Fibres - Web course

COURSE OUTLINE

The course would discuss the molecular architecture, configuration, conformation, amorphous and crystalline phases, glass transition, plasticization, crystallization, melting, factors affecting T_g and T_m of fiber forming polymers.

Essential requirements and examples of fibre forming polymers. Classification of fibres-natural and manmade. Basic structure of a fibre.

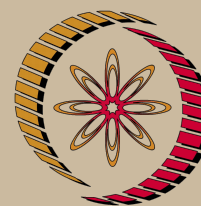
General properties of a fibre such as moisture absorption, tenacity, elongation, initial modulus, yield point, toughness, elastic recovery would be discussed.

Production of natural fibres, detailed chemical and physical structure of natural fibres-cotton, wool and silk, their basic properties would be discussed.

Production and structure of important bast and protein fibres would be detailed. Properties of Synthetic fibers and how they differ from their natural counterparts would be explained.

COURSE DETAIL

S.No	Topics	No. of Lectures
1	Classification of fibres-natural and manmade. General properties of a fibre such as moisture absorption. Mechanical properties like Tenacity, elongation, initial modulus, yield point, toughness, elastic recovery.	3
2	Essential requirements and examples of fibre forming polymers. Basic structure of a fibre. Molecular architecture, configuration, conformation.	2
3	Amorphous and crystalline phases. Glass transition, plasticization, crystallization, melting. Factors affecting T_g and T_m .	3
4	Production of cotton, - methods of harvesting and effects. Detailed chemical and physical structure of cotton. Properties of cotton.	4



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Textile Engineering

Additional Reading:

1. Fiber science and technology, Author Akira Nakamura Publisher Science Publishers, 2000.
2. Advance Fibre Spinning Technology by T. Nakajima (English Edition by K. Kajiwarra and J. E. McIntyre.

Hyperlinks:

1. www.apparesearch.com/fibers.htm
2. www.fibersource.com

Coordinators:

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5	<p>Introduction to important bast fibres.</p> <ol style="list-style-type: none"> 1. Discussion on Jute. 2. Sisal. 3. Ramie. 4. Hemp. 5. Banana. 6. Leaf fibers : Pineapple. 	8
6	<p>Protein fibres - basics.</p> <ol style="list-style-type: none"> 1. Detailed chemical, physical structure of wool. 2. Detailed chemical, physical structure of silk. 3. Properties and uses. 	8
7	<p>Regenerated fibers – basics.</p> <ol style="list-style-type: none"> 1. Discussion on Cupramonium rayon. 2. Viscose. 3. Lyocell, etc. 4. Properties. 	4
8	<p>Synthetic fibers – basics and difference with natural fibers.</p> <ol style="list-style-type: none"> 1. Nylon. 2. Polyester. 3. Polyolefins. 4. Acrylic. 	5
9	<p>Basics of High performance fibers and their properties when compared to normal apparel fibers.</p>	2
10	<p>Different fiber forms and their characteristics - Staple and Continuous.</p>	1

References:

1. Handbook of Fiber Science and Technology (International Fiber Science and Technology), edited by Menachem Lewin, CRC Press.
2. Manufactured Fibre Technology V B Gupta and V K Kothari.
3. Textile Fibres: Developments and Innovations, by V K Kothari.
4. Wool: Science and technology, Edited by W S Simpson and G Crawshaw, Woodhead Textiles Series.