



Syllabus

TXE6114: Textile Materials

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Class Meeting: Sunday 10:10 AM – 11:40 AM, Tuesday 11:40 AM – 1:10 PM Room 3013;
Lab: Monday 10:10 AM – 11:40 AM, Microscopic inspection lab

Level: Undergraduate (First Year in Textile Engineering)

Objectives:

- Learn the different types, sources, and properties of textile materials
- Develop the required practical skills to identify different types of fibers
- Provide the student with the basic knowledge for understanding the physics of textile fiber

Prerequisites: General chemistry, Physics

Textbook (Required):

- W. E. Morton and J. W. S. Hearle, *Physical properties of textile fibers*, Woodhead Publishing Limited, 4th edition, 2008
- S. Eichhorn, J. W. S. Hearle, M. Jaffe, and T. Kikutani, *Handbook of Textile Fibre Structure*, Elsevier Science, 2009. (Volumes 1 and 2)

Grading System:

Homework and Quizzes	20 %
In-class discussions & attendance	10 %
Mid-term exam	30 %
Project	<u>40 %</u>
Final Exam	100 %

Grading Scale:

85 % ≤ Excellent	
75 % ≤ Very Good	< 85 %
65 % ≤ Good	< 75 %
55 % ≤ Accepted	< 65 %
Failed	< 55 %

Homework: Some problems will be assigned to cover the material of each session and they will be due at the beginning of the next meeting. Late submission for homework will not be allowed and partial credit might be applied at this situation. Collaborative work is welcome but students should write their partner's name on the submitted solution. Occasionally, selected assigned problems will be collected for grading.

Quizzes: Unannounced in-class quizzes based on the completed homework (No make-ups for these quizzes)

Communication: Office hours for the instructor will be announced. You may contact the instructor by email at anytime. It's your responsibility to watch your email account for messages from the instructor which may contain vital information regarding the class. The Moodle system provided by the university will be used as an official means of communication between the student and the instructor.

Accessibility Policy: Students who need special accommodations should make an appointment to see the instructor in the first week of the class. A reasonable accommodation will be provided for persons defined as having a disability.



Academic Honesty: All submitted work during the class should be an original work of the student. The used references should be cited clearly on the student's work. The use of references should be responsible and no copy-paste will be allowed. Violation of these rules will result in the application of the proper legal actions against the student according to the policies of the university.

Course Contents:

Week	Topic
1	Class orientation and introduction
2	Introduction to materials science and engineering
3, 4, 5	Macrostructure, microstructure, sub-microscopic structure and fine structure of fibers
6	Basic requirements for a polymer to form a textile fiber
7, 8	Cellulosic fibers (cotton, flax, hemp, jute and sisal)
9	Protein fibers (wool, silk)
10, 11	Regenerated fibers (Cellulosic: viscose rayon, cellulose acetate, alginate; Protein: casein, spider silk)
12, 13	Synthetic fibers (polyamides, polyesters, acrylic, polyolefin, polyurethane, polylactic acid, vinyls)
14, 15	Special high performance fibers: – Kevlar, nomex, vectran, zylone, spectra, M5 – Inorganic fibers: glass, ceramic – Carbon fibers
