

Spring 2003

TMI 6130

CHEMICAL AND INSTRUMENTAL ANALYSIS OF TEXTILE MATERIALS

Instructor: Dr. Charles Q. Yang
361 Dawson Hall
542-4912 (O), 543-5056 (H)

Office Hours: 9:00 am- 12:00 pm, T- Th
3:30-5:00 pm, M-W-F
7:00-10:00 pm, M-T-W-Th-F

Course Objectives:

TXMI 6130 emphasizes on the principles and instrumentations of traditional chemical analysis and modern instrumental analytical techniques, and the applications of those analytical techniques to the analysis of fibers and polymers, and problem-solving in research laboratories and industry. The objectives of this course are:

1. To understand the general theory of wet chemical analysis.
2. To understand the *theory, instrumentation* and *applications* of various instrumental methods used in analysis of textiles and polymeric.
3. To acquire certain skills of problem-solving in an industry environment.

Textbook and Reference:

1. Textbook -- "Principles of Instrumental Analysis" by Skoog/Leary, any editions.
2. References -- "Analytical Methods for a Textile Laboratory," ed. J.W. Weaver, AATCC, 3rd edition, 1984.

Evaluation:

Exam 1	90 pts
Exam 2	90 pts
3rd Exam	90 pts
Paper/presentation	30 pts
TOTAL	300 pts
A	100-91%
B	90-81%
C	70-80%

Course Policy

You are required to attend all exams. There will be no make-up exams. Your course grade will be solely based on your performance in the three exams. Class attendance is required. A student will be withdrawn if he/she misses 5 classes.

Course Outlines

1. Chemical and electrochemical analysis
2. Introduction to spectroscopy
3. UV-visible and fluorescence spectroscopy
4. Atomic absorption and atomic emission spectroscopy
5. Infrared and Raman spectroscopy
6. Nuclear magnetic resonance spectroscopy
7. Surface analysis
8. Mass spectroscope
9. Thermal analysis
10. Chromatography theory
11. Chromatography techniques: TLC, GC and HPLC

	<u>Tentative Schedule</u>	
	Topic	

1.	Chemical and electrochemical analysis	Week 1/2
2.	Introduction to spectroscopy	Week 3
3.	UV-visible, near-IR and fluorescence spectroscopy	Week 4
	First exam	Week 5
4.	Atomic spectroscopy	Week 5-6
5.	Infrared and Raman spectroscopy	Week 7-8
6.	Nuclear magnetic resonance spectroscopy	Week 9
7.	Surface spectroscopy	Week 10
	Second exam	Week 11
8.	Mass spectroscopy	Week 11-12
9.	Thermal analysis	Week 13
10.	Chromatography theory	Week 13
11.	Chromatography techniques: GC and HPLC	Week 14,15
	Exam 3	May 8, 8 am