

CME 320 Chemical Engineering Laboratory II: Chemical and Molecular Engineering (Required)

Course Instructor: *Dr. Miriam Rafailovich*

Website: none

Course Goals:

Introduction and operation of a continuous unit, handling of air-sensitive/water-sensitive materials, sonolysis and thermal techniques for materials synthesis, preparation of polymer nano-composites and nano-composites and nanosized materials [2 credits]

Pre- or Corequisite(s): CME 310

Text(s): *Perry's Chemical Engineers' Handbook (7th Ed.) R.H. Perry and D.W. Green (ed.) McGraw Hill, New York (1997)*

Advanced Catalysts and Nanostructured Materials – Modern Synthetic Methods, W.R. Moser, ed. Academic Press, New York, 1996.

A laboratory manual

Class/ Laboratory Schedule:

Spring: Lab, Friday, 10-40-2.30 pm

Topics Covered:

Week 1: continuous unit fundamentals and controls

Week 2: Operation of a continuous unit

Week 3: Operation of instrumentation associated with a continuous unit

Week 4: Lab Problem 1- mass balance in a continuous unit

Week 5: Synthesis set up: Polymerization

Week 6: Lab Problem 2- Synthesis of Nanocomposites

Week 7: Synthesis continued

Week 8: Nanocomposites: Physical properties measurements

Week 9: Make-up

Week 10: Nano Synthesis – Thermal method: Set up

Week 11: Problem 3- Batch synthesis of nanomaterials by thermal method

Week 12: Nano Synthesis- Sonolysis technique: Set up

Week 13: Lab Problem 4- Batch synthesis of nano materials by sonolysis

Week 14: Nanocomposites: Discussion Report due

Week 15: Nanocomposites: Discussion Report due

Contribution of course to meet professional component:

Relationship of course to program outcomes:

CTPC "3a-k" Outcomes	% contribution
A. Ability to apply knowledge of math, engineering, and science	9%
B. Ability to design and conduct experiments, analyze data	34%
C. Ability to design system, component or process to meet needs	17%
D. Ability to function on multi-disciplinary teams	9%
E. Ability to identify, formulate, and solve engineering problems	3%
F. Understanding of professional and ethical responsibility	5%
G. Ability to communicate effectively	7%
H. Broad education	2%
I. Recognition of need an ability to engage in life-long learning	2%
J. Knowledge of contemporary issues	2%
K. Ability to use techniques, skills, and tools in engineering practice	10%
Any other outcomes and assessments?	
	100%

Prepared by _____

Date Prepared: _____