Course Description: An introduction to polymers from synthesis to basic properties to structure/properties relationships. Understanding the implications of long chain molecular structures on their often unique set of properties.

Textbook: No required Text

*Fundamental principals of Polymeric Materials*, Rosen. 
*Textbook of Polymer Science*, Billmeyer

Assessment: Midterm Exam, 30%, Final Exam, 40%, Term Paper, 30%

Course Content:

1) Introduction: Overview of Polymer Properties and Thermoplastics, Elastomers and Thermosets.

2) Bonding Forces in Polymers: Primary and Secondary. Molecular Weight Distributions.

3) Polymer Synthesis: Homopolymers and Copolymers.

4) Molecular Models: The Freely Jointed Chain, Chain Statistics, etc.

5) Polymers in Solution. Measurements of Molecular Weight and Size.

6) Polymer Testing: Analysis of Thermal and Mechanical Properties.

7) Midterm Exam.

8) Semicrystalline Polymers: Polymer Single Crystals, Semi-Crystalline Polymer Morphology, Spherulites, and Crystallization and Melting Behaviors.

9) Morphology of copolymers.

10) Elastomers and Thermoplastic Elastomers


13) Applications of Polymers.

14) Review and (Last) Exam: Term Paper Due.