

**Rutgers University - Newark
Department of Chemistry**

**Polymer Chemistry
Course 514**

**Fall Semester 2016
Smith Hall – Rm 240
Tue 6:00 pm - 8:50 pm**

Course Description: This course begins with an introduction to polymer chemistry that will include an overview of polymer: 1) types, 2) nomenclature, and 3) physical states. Subsequent modules on methods of molecular weight determination, polymer synthesis, polymer reactivity, kinetics of polymerization etc.. are then presented. Topics of current interest are emphasized.

Instructor: Agostino Pietrangelo, Olson Hall, Rm 342
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Office Hours: Available upon request.

Level of course: This course is directed toward senior undergraduate and graduate students. Undergraduate organic chemistry is a prerequisite. Inorganic chemistry is helpful, and the basics of this discipline (as it pertains to the course material) will be reviewed.

Texts: 1) Odian, *Principles of Polymerization: 4th Edition*

Odian's book is highly recommended for this course (copies are available at Amazon). For additional reference materials, see:

2) Hiemenz and Lodge, *Polymer Chemistry: 2nd Edition*

3) Painter and Coleman, *Fundamentals of Polymer Science: An Introductory Text: Second Edition*

Course Breakdown:

Quizzes (x2) - Sept 27 th , Nov 8 th	10% (5% each)
Midterms (x2) - Oct 4 th , Nov 15 th	40% (20% each)
Presentation - Dec 6 th , Dec 13 th	10%
Final Exam - TBD	40%
Note: Quiz and midterm exam dates are tentative.	

Presentation: Each student will give a PowerPoint presentation on a *Polymer Chemistry* topic that will be assigned by Prof. Pietrangelo. Details will be given on a later date. The presentation is intended to be a fun exercise that will build your skills and confidence in discussing scientific literature.

A few suggestions:

- 1) Be clear and concise. The material you present **may** be found on the final exam
- 2) **Use ChemDraw for all chemical structures!!!** Failure to do so will result in a deduction of marks
- 3) Minimize text on your slides. ***Your audience knows how to read.*** You do not need to dictate to them.
- 4) Read the scientific literature on your topic

The main topics to be treated in class are:

- 1) *Introduction to Polymer Chemistry.* Topics include i) polymer types, ii) polymer nomenclature, iii) molecular weight determination, iv) physical states, v) mechanical properties, and vi) polymer characterization
- 2) *Synthesis of Polymers.* Topics include i) step-growth polymerization, ii) chain-growth polymerization, iii) ionic chain polymerization, v) ring-opening polymerization
- 3) *Selected topics.* This will include, but is not limited to: i) polymer stereochemistry, ii) polymer reactivity, iii) kinetics of polymerization, iv) polymer-based materials, etc....