

2006

Chemistry 6564, Index 11358 (3 credits)

Advanced Macromolecular Chemistry

Instructors: J. E. McGrath, H.W. Gibson and J.S. Riffle

Time/Location: 12:30 to 1:45, Tuesday and Thursday, Chem-Physics 402


**TEXT: G. Odian, Principles of Polymerization, 4th Edition, Wiley and Sons, 2004
ISBN: 0-471-27400-3 (STRONGLY RECOMMENDED)**

The subject matter to be covered by Professor McGrath will include state of the art and current synthetic activities in: elastomers, ionic polymerization, emulsion polymerization, hydrophilic polymers, coordination polymerization of olefins and diolefins, graft and block copolymers and degradation/stabilization of polymers. Prof. Gibson will cover controlled free radical polymerization, chemical modification of polymers, and unsaturated conjugated polymers.

Professor J.S. Riffle will contribute lectures on ring opening polymerization.

Lecture Dates and Instructors

D R A F T	January 17	JEM	Emulsion Copolymerization: Emphasis on Synthetic Elastomers, SBR, NBR, Acrylics, Fluoropolymers and Rubber Toughened Thermoplastics (ABS, etc.)
	January 19	HWG	Ring Opening Polymerization I
	January 24	HWG	Ring Opening Polymerization II
	January 26	HWG	"Controlled" Free Radical Polymerization I
	January 31	HWG	"Controlled" Free Radical Polymerization II
	February 2	JEM	Emulsion Copolymerization
	February 7	JEM	Ionic Polymerization I
	February 9	JEM	Ionic Polymerization II
	February 14	JEM	Coordination Polymerization I
	February 16	JEM	Coordination Polymerization I
	February 21	JEM	Block Copolymers I
	February 23	JEM	Block Copolymers II

February 28	JEM	TEST ONE
March 2		Synthesis of Ion Containing Copolymers (Ionomers)
MARCH 6-12		 SPRING BREAK
March 14	HWG	Metal Catalyzed Polymerizations I
March 16	HWG	Metal Catalyzed Polymerizations II
March 21	HWG	Unsaturated Conjugated Polymers
March 23	HWG	Chemical Modification of Polymers I
March 28	JSR	Ring Opening Polymerization I
March 30	JSR	Ring Opening Polymerization II
April 4	JSR	Ring Opening Polymerization III
April 6	JSR	Ring Opening Polymerization IV
April 11	JSR	Ring Opening Polymerization V
April 13		TEST TWO
April 18	HWG	Dendrimers and Hyperbranched Polymers
April 20	HWG	Self-Assembly and Mechanically Linked Polymers
April 25	HWG	Chemical Modification of Polymers II
April 27	JEM	Polymer Degradation and Stabilization
May 2	JEM	Polymer Degradation and Stabilization
???		FINAL EXAM

Grading will include *two midterm tests along with a final exam*. In addition, the course requirements will include written two-page summaries of recent journal references provided by the instructors after each lecture. The writing style and content will both be part of the resulting grades. We anticipate the two midterm tests will add up to a total of 50%, the final exam (comprehensive) will be an additional 25%, and the homework, including the two-page write-ups will correspond to 25%.