

**Course Information**  
**Organic Mechanism and Structure (CHEM 513)**  
**Spring 2013**

**Course:** Chemistry 513 is scheduled to meet Monday, Wednesday and Friday from 8:00 AM to 8:50 AM in STC 122.

**Instructor:** Allan D. Headley

**Office:** Science Building, 307

**Office Hours:** Wednesdays 11:00 AM to 12:00 Noon, other times by appointment.

**Contact Information:** (903) 468-8106; [allan.headley@tamuc.edu](mailto:allan.headley@tamuc.edu)

**Text:** Your basic text is "Structure and Mechanism in Organic Chemistry" Felix A. Carroll, Brooks/Cole Publishing Company, New York, 1998.

**Course Objectives:** This course is designed to develop and improve the student's ability to think critically and analytically and to apply that approach to solve problems scientifically based on available information. Students of this course will not only gain a thorough knowledge and understanding of the principles and mechanism of organic chemistry, but will also have the ability to utilize the knowledge gained in the development of new ideas for their research.

**University Policies, Procedures, Statements and Notifications:**

<http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/>

**Important Dates:** Visit the following website for important university dates:

<http://www.tamuc.edu/admissions/registrar/academicCalendars/default.aspx>

**EXAMINATIONS**

**First Midterm:** Week of February 25, 2013  
**Second Midterm:** Week of April 8, 2013  
**Final Exam:** Week of May 6, 2013

Each midterm exam is worth 100 points (20% of your final grade); 20% of your grade will come from a modeling project in which Spartan, a modeling software will be used; the final exam is worth 200 points (40% of your final grade).

Any student who, because of a disabling condition, may request that special arrangements be made in order to meet the course requirements. This student should contact the instructor as soon as possible so that necessary accommodations can be made.

**TENTATIVE SYLLABUS\***

Week of	TOPICS TO BE COVERED	READING ASSIGNMENT
Jan 14	Introduction & stereochemistry	59 – 110
Jan 21	Reactive intermediates	246 – 312

Jan 28	Methods of studying reactions	316 – 323
Feb 4	Methods of studying reactions	323 – 332
Feb 11	Methods of studying reactions	332 – 350
Feb 18	Models of atomic and molecular structure	1-54
<b>Feb 25</b>	<b>Midterms #1</b>	
Mar 4	Molecular modeling and applications, including Spartan	119-173
Mar 11	Spring Break	
Mar 18	Methods of studying reactions	351 – 386
Mar 25	Acid-base catalyzed reactions	394 – 448
Apr 1	Substitution reactions	453 – 506
<b>Apr 8</b>	<b>Midterm #2</b>	
Apr 15	Substitution reactions	506 - 542
Apr 22	Addition reactions	548 – 637
Apr 29	Elimination reactions	641 – 703
May 6	<b>Final Exam</b>	

### Reference Books

- Hehre, W. J.; Shusterman, A. J.; Huang, W. W. "A Laboratory Boon of Computational Organic Chemistry," Wavefunction, Inc., 1996 (ISBN 0-9643495-8).
- Hehre, W. J.; Shusterman, A. J.; Nelson, J. E. "The Molecular Modeling Workbook for Organic Chemistry," Wavefunction, Inc. CA. 1998 (ISBN: 1-890661-06-6).
- Hehre, W. J. "A Guide to Molecular Mechanics and Quantum Chemical Calculations," Wavefunction, Inc., 2003 (ISBN:1-890661-18-X).
- "Getting Started With Spartan," 3<sup>rd</sup> Edition (Spartan Student Edition), Wavefunction, Inc., 2002-2004 (ISBN:1-890661-25-2).
- Anslyn, E.; Dougherty, D. A. "Modern Physical Organic Chemistry," University Science Books, CA, 2006 (ISBN: 1-891389-31-9).
- Lowry and Richardson, *Mechanism and Theory in Organic Chemistry*, 3rd Edn, 1987.
- Isaacs, N. C. *Physical Organic Chemistry*; John Wiley & Sons: New York, 1987.
- Carpenter, B. K. *Determination of Organic Reaction Mechanisms*; Wiley & Sons: 1984.
- Carey and Sunberg "Advanced Organic Chemistry - Part A," 1984
- March, J. "Advanced Organic Chemistry, 4th edition: Reactions Mechanism and Structure, 1992.
- Smith, M. B. *Organic Synthesis*, McGraw-Hill, 1994.
- Ritchie, *Physical Organic Chemistry - The Fundamental Concepts*, 1975
- Jones, *Physical and Mechanistic Organic Chemistry*, 1984
- Isaacs, *Physical Organic Chemistry*, London, 1990.
- P. Sykes, *Mechanism In Organic Chemistry*, 1965.
- Bernard Miller "Advanced Organic Chemistry, Reaction and Mechanism" 2<sup>nd</sup> Ed. Prentice Hall, New Jersey, 2003.
- Eric V. Anslyn and Dennis A. Dougherty "Modern Physical Organic Chemistry" University Science Books, Sausalito, CA, 2006.

\* Please note that this schedule and topics are subject to change