

## Chemistry 506, Syllabus, Winter 2000

**Lecturer:** **Dr. Allen Hunter** (Office 5015, NMR Lab 5031, X-Ray Lab 5024/5020, Advanced Synthesis Lab 5005)  
 Phone: 742-7176 (Office), 742-2261 (NMR and X-Ray Labs)  
 E-mail: [adhunter@cc.ysu.edu](mailto:adhunter@cc.ysu.edu)  
 Home Page: <http://www.as.ysu.edu/~adhunter/index.html>

**Textbooks:**

1. Bettelheim and March, "General, Organic & Biochemistry", 5<sup>th</sup> Edition, Harcourt Brace College Publishers, 1998 (required).
2. Bettelheim and March, "General, Organic & Biochemistry: Study Guide", 4<sup>th</sup> Edition, Harcourt Brace College Publishers, 1998 (recommended).
3. Chemistry 506 Problem Sets and Old Exams, Available at the front desk of Maag Library (required).
4. Molecular Model Set (strongly recommended, use will be allowed during exams).

**Lecture:** Monday, Wednesday, and Friday 12:00 to 12:50 in Engineering Science 2000. **Labs Start Monday, January 3<sup>rd</sup>.** **YOU MUST COME TO THE FIRST LAB ON TIME!!!!!!**

**Office Hours:** Monday and Wednesday 10:00 to 12:00 and Friday 11:00 to 12:00. Please feel free to drop in and see me any time during my office hours or during the rest of the week. If you want to be sure to have me there at a specific time outside of my office hours, make an appointment during class or over the phone. I'll generally be in WB 5015 (my office), 5031 (the NMR lab), or 5024/5020 (the X-ray lab) at these other times.

**Course Objectives:** To study the basic concepts of organic chemistry and biochemistry by building upon the basics of bonding and structure learned in Chemistry 505, to experience the many practical techniques used by the organic chemist and biochemist in the modern laboratory, and to build an appreciation of the importance of these topics in such fields as biology, medicine, and the chemical industry. By the end of this class, students will learn to:

- distinguish between the major functional groups found in organic molecules.
- understand how functional groups influence a molecule's physical and chemical properties.
- identify three major classes of biomolecules: carbohydrates, lipids, and proteins and understand the different roles of each.
- understand the function and regulation of enzymes.
- distinguish between catabolic and anabolic pathways of metabolism.
- explain several biochemical pathways by which living organisms extract energy from the food they ingest.

**Course Philosophy:** In the Chemistry 506 lecture we will be covering selected topics in the chapters in the text dealing with Organic Chemistry and Biochemistry (i.e., parts of Chapters 10 through 21).

Chapter	Title
	Introduction to Chemistry 506
10	Basics of Structure and Bonding: "Structure and Bonding in Alkanes".
11	Hydrocarbons with Multiple Bonds: "Alkenes, Alkynes, and Aromatic Compounds".
12	Functional Groups with Single Bonds to Oxygen: "Alcohols, Phenols, Ethers, and Halides".
13	Functional Groups with Double Bonds to Oxygen: "Aldehydes and Ketones".
14	Functional Groups with Single and Double Bonds to Oxygen: "Carboxylic Acids and Esters".
15	Functional Groups with Single Bonds to Nitrogen: "Amines and Amides".
16	Biochemical Alcohols/Ethers: "Carbohydrates".
17	Biochemical Esters and Hydrocarbons: "Lipids".
18	Biochemical Amides: "Proteins".
19	Biochemical Catalysts: "Enzymes".
20	"Bioenergetics. How the Body Converts Food to Energy".
21	"Specific Catabolic Pathways: Carbohydrates, Lipid, and Protein Metabolism".
	<b>Final Exam (comprehensive)</b>

- This schedule is tentative and the order and relative weighting of topics may be revised as the class progresses.

GRADING SYSTEM	TOTAL POINTS
Midterm Exam	150
Laboratory Grade	100
Final Exam (Friday, March 17 <sup>th</sup> at 10:30, comprehensive)	<u>200</u>
Total	<u>450</u>

A 90 - 100%, B 80 - 89%, C 65 - 79%, D 50 - 64%, F Below 50%.

**Exams:** The midterm exam will be given on the day following the completion of the material to be examined. The exact date will be announced in class. ***MAKE-UP EXAMS WILL NOT BE GIVEN***. Absences that have not been approved in advance will result in a grade of **ZERO** for that exam. Approved absences for sporting events, holidays, etc. will be given **only** if I am informed in advance and only if I agree. Absences for health reasons or family emergencies must be discussed with me *within 24 hours* of the missed exams for approval to be granted. The points for exams missed during approved absences will be applied to the final exam. In all cases, I must be given a written note explaining the reason for the approved absence and asking to have the points applied to the final exam within one week of the missed exam. If you believe that your exam has been miss-graded or miss-totaled, the **unaltered** exam must be submitted for re-grading *within 48 hours* after it has been returned. The whole exam will be re-graded, not just single questions. **You must bring photo ID with you when you write exams and place it on the desk top.**

**Attendance:** Lecture attendance is **mandatory** and will be recorded through daily sign-in sheets *at the start of each class period*. Your timely arrival in class is expected. It is **your responsibility** to be sure you sign in and therefore if you fail to arrive on time or do not sign in you will be deemed to be absent. **Students are responsible for all information, material, and announcements made in class.** Attendance in class, **as recorded on the sign in sheets**, is used in deciding borderline grades.

**Assigned Readings, Problems, and Studying:** You are required to read the assigned chapters from the lecture and lab texts **before** we discuss them in class. Some question based on these will appear on exams. I will assign problems from the text and problem sets regularly. These will not be graded but are very important since these are the questions on which most of the exams will be based! **It is recommended that for all courses students study at least 2 to 3 hours outside of class for every scheduled class hour. For Chemistry 506, this corresponds to approximately 10 hours a week.** Experience in past years suggests that this is a minimum for success in Chemistry 506 (many students who have taken this class in the past report that it was the most difficult course that they took as an undergraduate).

**Repeating the Class:** When repeating a course, the Chemistry Department has decided that it is in the best interest of our students to have all students repeat the entire course, *including the current laboratory!*

**Passing the Laboratory:** To pass the course, you must obtain a grade of at least 70% in the laboratory portion and you must have successfully completed all the scheduled experiments.

**Safety:** The potential of risk is present in some lecture demonstrations and laboratory experiments. Accidents have been rare, but have happened. Faculty and staff members exercise great care to minimize and, where possible, eliminate all potential hazards. Additionally, minimization of risks requires that students come well prepared for each assigned exercise and are attentive in class. Safety glasses must be worn in the laboratory at all times. If you have a condition (e.g., chemical sensitivity, pregnancy) that might affect your laboratory safety, discuss it with your physician and instructor and alternate arrangements for the lab may be made. Contact the instructor immediately if you have any questions on this or any other safety issues.

**Materials fees:** The materials fees collected for this laboratory course are used to partially defray the cost of replacing expendable materials and obsolete equipment, repairing equipment, and obtaining new equipment appropriate for student use in state of the art instruction in the laboratory science of chemistry.

**Academic Honesty:** In accordance with university policy and professional standards, the highest levels of academic integrity are expected in this lecture and lab. The code of student conduct will be *strictly* enforced. Academic dishonesty will result in reductions in grades and/or expulsion from this class and/or the university. [*Note: Representative exams are photocopied before they are returned. These photocopies are compared to the originals returned for re-grading to check if answers have been altered.*]

**Computer Laboratory:** The "Windows 95" computer lab is located in room WB 5043 and contains 25 Pentium II computers equipped with a range of software. It is available for students to work on their chemistry assignments during the posted hours.