

**CHEM 346**  
**Qualitative Organic Analysis**  
**Fall 2006-07**  
**Syllabus**

5.5 credits: 9 hr laboratory/week; 1 hr lecture/week

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Required Text: "The Systematic Identification of Organic Compounds, 8<sup>th</sup> Ed. Shriner, et. al. 2004.

Recommended 2<sup>nd</sup> text: "Spectroscopic Identification of Organic Compounds" Silverstein, et. al. 7th edition 1998

**Objectives of the course:**

- 1) To identify several organic unknowns using wet and spectroscopic methods using a systematic and reasoned approach.
- 2) To learn to solve practical organic laboratory problems in a logical and efficient manner and to gain additional experience in performing laboratory experiments on a relatively small scale.

**Particulars**

1. You will be expected to definitively identify four (3) single unknown compounds and separate and identify one (1) mixture (2 or 3 components). In order to aid in a systematic approach to identification of the unknowns, laboratory report forms are supplied which should be followed and are to be filled out and turned in with each unknown. These report forms follow a logical procedure that will allow you to proceed from a large list of potential unknowns to a definitive answer for each. In addition to the lab reports you must keep a laboratory notebook which must be turned in at the end of the course. Keeping a neat, up-to-date notebook is essential for any laboratory and the quality and completeness will be taken into account in grade assignments. Since the course drop date is by the end of the 6<sup>th</sup> week, the first lab report is due at the end of the 5th week.
2. You may not use only spectroscopic methods to identify a compound or pinpoint a particular functional group. For example, if the IR spectrum displays an absorption between 1750 and 1650<sup>-1</sup>, probably indicating the presence of a carbonyl, you must also do classification tests to confirm the presence of a carbonyl group. One of the aims of the laboratory work is to provide experience in small scale reaction techniques. You must also fully interpret the IR and <sup>1</sup>H NMR of your compound in the lab report (except for the first unknown-see below).

3. The first unknown will be solved without the aid of spectroscopic means. However, this first unknown is guaranteed to be in the Tables listed in the text. Subsequent unknowns may not be in the text (i.e. you may have to consult other sources).
4. For each unknown, you are required to hand in two (2) solid derivatives. Exceptions to this for difficult unknowns will be made on an individual basis.
5. For the mixture, the method of separation must be listed in detail on a separate sheet to be turned in with the lab reports for the mixture components. Also included should be the rationale for choosing the particular method of separation.
6. Your grade will be based on the 5 (or 6) lab reports (100 pts each, a final exam (100 pts). And your notebook (50 pts). Obviously then the reports are very important and should be treated as such. Neatness counts. Also, very few unknowns are “missed” but reports which do not lead to the unique answers logically will have points deducted. It is not sufficient to say “This must be my compound because nothing else fits.” The identity of the compounds must be proven.
7. A final word of caution. This organic laboratory course is probably unlike any you have taken to date. Instead of standard experiments which everyone does the same experiments in a somewhat “cookbook” style, each student will have to perform different experiments (for each unknown), the nature of which are determined separately by each student. In this sense the lab work is more like research and carries with it some of the same problems experienced in research, mainly frustration. Things don’t always go right and the tendency sometimes is to avoid the problem (and sometimes to avoid the lab). **DON’T DO THIS.** Make sure you work hard from day one and efficiently utilize the lab time. Also, time organization is extremely important. Plan and know what you wish to accomplish before you come to lab.
8. In spite of dedication to completion, sometimes students run into “brick walls” and cannot finish during the term. As long as you have attended regularly, this is not a problem and an Incomplete Grade can be assigned. **HOWEVER, IF ATTENDANCE IS NOT REGULAR AND NO COMMUNICATION AS TO THE REASON(S) IS MADE, A GRADE WILL BE ASSIGNED ACCORDING TO THE WORK ACCOMPLISHED.**

**ALSO REMEMBER, YOUR INSTRUCTORS ARE HERE TO HELP YOU. PLEASE DO NOT HESITATE TO ASK FOR HELP OR SUGGESTIONS**