

CH 525
Chromatography
Spring Semester, 2003

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Office Hours: M,W 12:00-2:00 and
anytime you can catch me

COURSE OUTLINE AND GENERAL INFORMATION

BOOK REQUIRED: K. Robarts, et al. *Principles and Practice of Modern Chromatographic Methods*, Academic Press, San Diego, Ca, 1994.

OTHER TEXTS AND MATERIALS: Course notes, handouts, reprints.

COURSE DESCRIPTION:

The purpose of this course is to transmit the fundamental concepts of chromatography and familiarize you with current trends in modern instrumentation. Heavy emphasis will be placed on instrumentation, the correct analytical methodology towards problem solving, and the accurate evaluation of system performance (or instrument malfunction). Theory will be underlined with practical examples throughout the course. The course will primarily cover the areas of gas chromatography and liquid chromatography. Ancillary techniques such as GC/MS and the interfacing to other instruments will also be covered. A few demonstrations will be scheduled as time permits.

The material will not strictly be divided into theory, instrumentation and applications as done in most textbooks. We will try instead to develop the necessary models as we go along and thus incorporate applications as much as possible.

It is rather difficult to stick to a fixed schedule. Off and on, the recommended text will be supplemented. You can see from the overheads where the information presented at a particular lecture comes from. Most of the important diagrams and figures have been transferred to transparencies. I will try to provide you with copies of most of the transparencies which are not coming from Robart's book. You should not have to hunt down information from obscure sources. I find it always helpful to underline sections of text which need to be emphasized or add notes/keywords to some of the figures/diagrams. You can't write as fast as I speak but there is enough time to jot down a memory aid. The taking of notes takes away from thinking and I will try to relieve you as much as possible from mechanical work such as writing. It is a good idea to make a note of the number of a figure or table from the transparency. Doing so helps you to retrace the contents of a presentation even though you don't have enough time to copy all of the information. This also helps you if you are not able to follow in class. The same applies to basic equations. You will be given a summary of equations which you should commit to memory. A considerable number of handouts will be passed out as we go along. Most of these are specific applications or newest information from current literature and manufacturers' information.

There will be a substantial semester project in this course, dealing with an actual analysis and the evaluation of chromatograms. Each student will be checked out on the departmental GC/MS and the new HPLC. You should then be a fully qualified operator at the end of the semester. It is necessary that you work this project on your own. Each student will receive an individually prepared sample. Details will follow. Work individually and do not share information with each other. If you don't quite understand what I am after, please see me and I will be glad to explain. Continuous study is absolutely required throughout the course. It is not possible to keep on top of the material if it accumulates until the day before the test. One of the goals of this course is to make you fairly proficient in the use of modern instrumentation. We will choose GC/MS as our tool. You will receive an introduction on the instrument and are then asked to use a computer based

tutorial. After learning to safely run the instrument you will be asked to optimize the separation of alkene isomers, an experiment conducted in CH 237 (organic laboratory). You will also be given an unknown sample and will be asked to do qualitative and quantitative analysis on that sample. A detailed guideline will be provided.

Classroom participation is encouraged. Please work along with me. You will need to do a lot of reading on your own, as should be expected in an upper level course. You should take advantage of the office hours and come by for help. I will try to assist you in studying the "right material". I will also offer help sessions, as needed.

The class will be relatively small. I will have a chance to interact with you individually and expect that you come to class prepared. To this end, I will announce at the end of each class what material we will cover in the next class. You will receive a grade for classroom performance. I will ask questions and you will receive either a plus (+) or minus (-) depending on how sensible your answer is. Continuous study and preparation will clearly help.

EXAMS:

There will be 3 exams, about 1 hour each. The last one happens to fall on the date of the announced final. It will not be comprehensive.

3 exams	75 pts.
Home assignment	10 pts.
Practical laboratory exercise	10 pts.
Classroom participation	5 pts.
Total	100 pts.