

## Chemistry 450 Syllabus – Fall 2007

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Lab Meeting: Th from 9:00 – 11:50 in Julian 338  
Class Meeting: F from 2:00 – 2:50 in Julian 372

If you pick up and read almost any paper from the chemical literature you will find sections that rely on a careful chemical analysis. A paper in physical organic chemistry, for example, might include a detailed stopped-flow kinetic analysis of a chemical reaction. The paper's experimental section provides the necessary details for the kinetic studies. But how do the authors know that their method produces acceptable results and, more importantly, why should you trust that it does? If you trace back through the paper's references, eventually you will find a paper describing a careful evaluation of stopped-flow kinetics that characterizes its analytical usefulness. Developing such analytical methods is an important part of the field known as analytical chemistry.

**Course Goals.** The goal of Chem 450 is to gain practical experience in characterizing and validating a quantitative analytical method. To accomplish this you will learn to

- obtain representative samples
- standardize analytical methods using external standards, internal standards or standard additions
- analyze sources of uncertainty

**Textbook and Other Required Materials.** The textbook for the course is *Modern Analytical Chemistry*, which is available from the Fine Print Bookstore in downtown Greencastle and the campus bookstore. This also is the textbook for Chem 351 (Chemometrics), Chem 352 (Analytical Equilibrium) and Chem 353 (Instrumental Analysis). Purchasing the textbook is optional and a copy is available on reserve in the Prevo library (under Chem 352). Additional resources are available at the course's web site.

**Course Mechanics.** A tentative schedule is shown below and is subject to modification; see the course web site (<http://fs6.depauw.edu:50080/~harvey/Chem%20450/Index.html>) for the current schedule. During the first four class meetings we will discuss several important aspects of method development that will be important to your work in lab. During the remainder of the semester, we will divide class time between individual meetings and group meetings during which we will discuss your progress in lab.

Week of	Thursday (Lab)	Friday (Class)
August 20 <sup>th</sup>	No lab meeting	Introduction to Course and the Language of Analytical Chemistry
August 27 <sup>th</sup>	Sampling and “The Weakest Link”	Discussion of sampling
September 3 <sup>rd</sup>	The Need for Standardizations and “Developing an Analytical Method for PNP”	Discussion of validating analytical methods
September 10 <sup>th</sup>	Method Development Project	Discussion of measurement uncertainty
September 17 <sup>th</sup>	Method Development Project	<b>Individual Meetings</b>
September 24 <sup>th</sup>	Method Development Project	<b>Progress Reports</b>
October 1 <sup>st</sup>	Method Development Project	<b>Individual Meetings</b>
October 8 <sup>th</sup>	Method Development Project	<b>Progress Reports</b>
October 15 <sup>th</sup>	Fall Break	Fall Break
October 22 <sup>nd</sup>	Method Development Project	<b>Individual Meetings</b>
October 29 <sup>th</sup>	Method Development Project	<b>Progress Reports</b>
November 5 <sup>th</sup>	Method Development Project	<b>Individual Meetings</b>
November 12 <sup>th</sup>	Method Development Project	<b>Progress Reports</b>
November 19 <sup>th</sup>	Thanksgiving Break	Thanksgiving Break
November 26 <sup>th</sup>	Method Development Project	<b>Individual Meeting</b>
December 3 <sup>rd</sup>	Check-Out and <b>Final Reports</b>	No class
<b>Week of December 10<sup>th</sup> – Oral “final exam” over your project</b>		

Items in **bold** are speaking and listening assignments for S-certification (see below for more details)

**The Method Development Project.** This project, which is the course’s centerpiece, is a 10-week project in which you will validate an analytical method. Further details are in a separate handout.

**Grading:** The method development project accounts for 80% of your final grade. The additional 20% will come from any or all of the following, depending upon how the spirit moves us: problem sets, other lab work, short papers, oral presentations and participation in discussion.

Grades are assigned using the following scale:

A 100 to 93	B+ 89 to 87	C+ 79 to 77	D+ 69 to 67	F 59 and below
A- 92 to 90	B 86 to 83	C 76 to 73	D 66 to 63	
	B- 82 to 80	C- 72 to 70	D- 62 to 60	

These ranges are fixed with the following caveat – At the instructor’s discretion, grades on a borderline may be moved up or down by a maximum of 1 point to account for intangible factors; thus, for example, a 79 may become an 80, or an 80 may become a 79. Intangible factors that may affect your grade include, but are not limited to, a particularly strong or weak final exam, a steady improvement or decline in performance during the term, or a particularly strong or weak contribution to the class or lab.

This course is as an S-course. To achieve S-certification you must satisfactorily complete the speaking and listening assignments, which, in the tentative schedule are highlighted in **bold**. You will receive ample warning if you are in danger of not achieving certification.

**Policy on Late Work.** Due dates are intended to keep you from falling behind in your work. Because I value thoughtful, well-written work more than absolute deadlines, these due dates are intentionally flexible. There is no penalty for turning work in late if I am still in the process of grading the assignment; however, once I finish grading a set of assignments, any missing work receives a grade of zero – no exceptions. Flexibility in due dates is not a license to procrastinate and abuse of this policy will result in your loss of this privilege. To take advantage of this policy you must consult with me before the assignment is due and show evidence of having made significant progress.

**Policy on Attendance.** Although I do not require attendance during class meetings, I encourage you to take advantage of class time as an opportunity to more fully engage yourself with the material. If you do need to miss class for legitimate reasons, or if you simply don't feel like coming, it is your responsibility to know and understand what was covered. Ask a classmate for a copy of his or her notes, drop by my office or visit the course's web-site. We cannot take class time to review material for students who were unable to attend class. *Missing a class on a day emphasizing oral participation is not a good idea.*

**Office Hours:** I do not limit office hours to a few limited times scattered throughout the week. Instead, my office door is usually open and you are encouraged to stop by whenever you have free time; good times to find me are 8-11 MWF and 8-4 T. If you are uncomfortable just dropping by or wish to ensure that I am available, then feel free to schedule an appointment; my contact information is at the beginning of the syllabus. My home phone number is listed at the beginning of the syllabus should you need to reach me in the evenings (before 10 PM) or on the weekends.

**Academic Integrity:** Although you may make frequent use of external resources (e.g. the internet, the library, other students) when completing assignments, it is important that the work you submit represents your understanding of the assignment. Failure to do this is unethical and a serious breach of academic integrity. Be sure to review DePauw's guidelines for academic integrity, which are included in the [Student Handbook](#). In particular, review the examples of plagiarism, which, although often unintentional, is nevertheless a serious violation that can result in a significant reduction in the grade for an assignment or for the course.