

Syllabus
Zoology 585/582 Special Topics
Analytical Methods in Toxicology

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Office Hours: By Appointment
Texts: Handbook of Ecotoxicology

Environmental scientists currently have available to them an amazing array of powerful tools for obtaining qualitative and quantitative information about contaminants in the environment. The efficient use of these analytical tools requires that the individual have an understanding of the fundamental principles upon which these analytical tools function. The course will cover topics in chromatography, toxicokinetic modeling, and quantitative structure activity relationships. It will also include hands-on experience with thin-layer chromatography, gas chromatography, liquid scintillation counting and various extraction techniques. This is an advanced class for students interested in the analytical tools used in the field of environmental toxicology.

Week #	Lecture Topics
1-4	Introduction, Topics in chromatography, TLC, GC Labs 1 & 2
5-6	FAA, ICP, metal techniques, HPLC, Lab 3
7-8	Liquid Scintillation Counting (LSC), Dismantle 5880 GC
9	MIDTERM , Rebuild GC, Lab 4
10-13	Toxicokinetics, BCF, BAF measurements (Chapter 30), Labs 5 & 6
14-16	Quantitative Structure Activity Relationships (QSARS) (Chapter 3) Molecular Connectivity, Linear Solvation, Fate Modeling
17	COMPREHENSIVE FINAL

Lab #	Lab Topics
1	Thin Layer Chromatography
2	Introduction to 5880 GC, Making standards SPLIT CLASS (no lab report due)
3	GC lab (gasoline) SPLIT CLASS
4	Dismantle GC and Rebuild 5880 GC and rerun calibration standards (Include results as part of Lab #3 report)
5	Radiolabeled Chemical Analysis and Use of LSC (SPLIT CLASS)
6	Toxicokinetics - BCF determination

COURSE METHODOLOGY

There will be two exams given during the semester; a midterm and a comprehensive final. Each examination will consist of questions taken from lecture material, from laboratory experiences and assigned readings from your text and from the literature. Exams will be a combination of definitions, problems and short essay questions. If needed, a makeup exam will be offered, however different test items and format from the original exam will be used.

The remaining portion of your grade will be determined from your lab work and group project. Five labs will be performed during the assigned lab times, with additional time required for completion of many of the labs including the class project. A short (10 page or less) typed report is due one week after the completion of the lab. The format of these reports is as follows: Title, objectives, analysis and discussion (see example). Lab reports will be graded on proper format, timeliness (25 % of the grade will be deducted each day late) and correct analysis and interpretation. In addition, lab notebooks must be kept throughout the semester. Periodic checks on the lab notebooks will be completed throughout the semester. Lab notebooks will be graded on proper format, timeliness and adherence to Good Laboratory Practices (GLP) standards. The group project will check to see how well the group can rebuild a dismantled GC. Each student will take DETAILED notes while the instructor dismantles the GC. The group project grade will be based on a repeat run of individual standards which each student will make as part of Labs 2 & 3.

The percentages for exams and lab reports for students taking the class are as follows:

Exam 1 =	25 %
Final Exam =	25 %
Lab reports =	30 %
Lab notebooks =	10 %
Class participation =	10 %
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Total =	100 %

The following grading scale will be used:

- A = 90-100 %
- B = 80-90 %
- C = 70-80 %
- D = 60-70 %
- F = Below 60 %