

Chemistry 4000/6000 – Fall 2020 Quantitative Chemical Analysis

Lecture Instructor: Dr. Ning Fang (Email: nfang@gsu.edu)

Textbook: Quantitative Chemical Analysis, 8th or 9th edition, by Daniel C. Harris, W. H. Freeman and Co. (Any edition of this book has the same general information; the problems are different)

Laboratory Manual: distributed at the first day of the class.

Writing Guide: American Chemical Society Style Guide, available on Reserve in the library.

Required Materials: safety glass; bound laboratory notebook

Course Format:

All lectures will be **pre-recorded** and **posted on iCollege**. It is recommended that you watch the videos **before** the scheduled lecture time.

Lecture Time / Office Hour: T TH 10-11:30 am, on WebEx. Email me to setup appointments.

Course Description:

Chemistry 4000/6000 is one of the WAC (Writing Across the Curriculum) and CTW (Critical Thinking through Writing) courses offered by the Department of Chemistry at Georgia State University. The class includes two independent portions: lectures and laboratories. The lecture section of the course counts for 40% of the final grade; 60 % of the final grade will be derived from laboratory reports. **Make less than 50% of either section (20 pts for lecture and 30 pts of labs) will guarantee a grade of C- or lower.** There will be **two online midterm examinations (10% each)** and **an online final examination (20%)**.

The course is designed to teach critical thinking and scientific writing following the American Chemical Society style. In the laboratory sections, the students will follow and ultimately design experimental procedures independently, operate instruments commonly used in chemistry research, collect and analyze data, and draw conclusions and solve problems with scientific rationale. Four papers will be written using real data obtained in the laboratory section of the course. The papers will be returned with comments by lab instructor/s. The students will be allowed to rewrite, revise and resubmit. Please refer to the lab syllabus for details. By the end of the semester the student should be able to demonstrate skills learned in introductory composition courses (proper grammar, sentence structure etc), demonstrate proper ACS style (contains the proper sections, cites references properly, etc), and combine theory and real data in a logical manner (explain your data based on theory). The papers and laboratory notebook layout count 60% of the course grade.

Students are responsible for class preparation and for any material presented in class whether it is in the textbook or not. This is a highly structured course, with each new topic based on others previously developed. Furthermore, the lectures are the foundation for the laboratory experiments. The students are strongly recommended to view all recorded online lectures, and to keep consistently up-to-date in their readings and assignments. To fall even one class period behind is to risk considerable difficulty in mastery of future material. Students should 1) review previous material, especially if not perfectly understood 2) complete reading assignments before the lecture in which the topics are covered, or at least immediately after the lecture and 3) complete assigned problems and exercises on time, with an emphasis on mastery of concepts and principles involved rather than looking up an answer and finding the formula that gives you that answer.

The syllabus provides a general plan for the course; deviations may be necessary.

University policy requires that faculty members must, on a date after the midpoint of the course to be set by the provost (or his designee) 1) give a WF to all those students who are on the roll but no longer taking the class and 2) report the last day that the student attended or turned in an assignment.

Policy Statement Regarding Student Integrity

The Georgia State University Policy on Academic Honesty is in force in this course, including but not necessarily limited to infractions in the areas of Plagiarism, Cheating on Examinations, Unauthorized Collaboration, Falsification, and Multiple Submissions. The university's policy is published in the *On Campus: The Student Handbook*, available to all members of the university community. Therefore, all tests taken must represent your individual unaided efforts. To receive or offer information during an examination is cheating. The use of unauthorized supplementary materials during tests is also cheating. All laboratory work performed during the lab portion of a course must reflect your individual effort. Only original data obtained by your own in-lab experimentation are permitted to be used, except when specifically authorized by your laboratory professor. Data from supplementary sources (handbooks, reference literature, etc.) must be clearly referenced (title, author, volume, page(s), etc.). Falsification or destruction of data constitutes cheating. Conduct or actions that disrupt class or test periods or falsification of information related to chemistry courses by any student will be taken as violation of the policies of the Board of Regents of the University System of Georgia and the GSU Student Code of Conduct, Section 6.0. Any suspected offenses may be referred to the Department Chair or the Dean of Students for appropriate disciplinary action.

Dates	Major Contents (tentative)	Notes
	Introduction, Lab, ACS style and writing	
	Error and Statistics	
	Statistics	
	Calibration Methods, General Chemistry Concepts	
	Basics of Titration and Equilibrium	
TBA	First exam	
	Systematic Treatment of Equilibrium	
	Acid Base Basics, monoprotic,	
	Buffer	
Nov 23-28	Thanksgiving Break	
TBA	Second exam	
	Activity, pH measurement	
	Acid Base, polyprotic	
	EDTA	
	Instrumental Methods	
	Electrochemistry: basic concepts	
	Electrochemistry: electrodes and signal analysis	
	Electrochemistry: electrodes and signal analysis	
Final exam: Dec 8-15		