Chemistry 4000/6000 Quantitative Chemical Analysis

Syllabus (Fall 2017)

Lecture Instructor/s:

Dr. Gangli Wang
Office: NSC 420
Phone: (404) 413-5507 Email: glwang@gsu.edu
Office hour: Wednesday 10:30 am – noon; after lectures; or by appointment.

Meeting Time: M/W 5:30 – 6:20 PM
Location: Classroom South 105

Laboratory Location: Kell 698

Laboratory Instructors:

Dr. Tarushee Ahuja (Monday: 1:00 PM - 4:15 PM, Wednesday: 1:00 PM – 4:15 PM)
Office address: Rm. 208, Courtland North Building,
Email: tahuja1@gsu.edu,
Tel.: 404 413-6003

Dr. Yanyi Chen, or TBA (Tuesday: 5:30 PM – 8:45 PM)
Office address: Kell 694,
Email: ychen46@gsu.edu,
Phone: 404 413-5551

Dr. Jie Jiang (Tuesday: 9:00 AM - 12:15 PM)
Office address: Kell 235\,
Email: jjiang2@gsu.edu,
Tel.: 404 413-5259

Tutorial (CHEM 4001) Instructor:

Kyle Simmons
Time: 4:15 – 5:15 pm, MW
Location: ALD 305
Email: ksimmons14@student.gsu.edu

Textbook: Quantitative Chemical Analysis, 8th edition, by Daniel C. Harris, W. H. Freeman and Co.
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 Description and Learning Outcome:
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 (20pts for lecture and 30pts of labs) will guarantee a grade of C- or lower (you will need to retake the class).**

The units of the lectures are listed in the table. There will be two in-class examinations (10% each) and a final examination (20%). Each exam will have two sections. In closed book section, the most important principles or definitions will be found. In general these will be principles or theories that all chemists should know. In the open book section you will be asked to prove your understanding of the principles and theories covered in the lectures. The problems on this section are generally longer and will demand students to "think" rather than "regurgitate" material.

The tutorial course (CHEM 4001) will focus on two parts: problem solving related to the homework assignments in the lecture; and all laboratory aspects. The homework practice, especially problem solving, will only be performed in the tutorial section, not in the lectures. Those practices, together with the in-class exams, are foundational to the preparation of the lab reports.

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 attend all lectures consistently, 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.

Dates	**Major Contents (tentative)**	Notes
Aug. 21, 2017	Introduction, Lab, ACS style and writing	
	Error and Statistics	
	Statistics	
	Calibration Methods, General Chemistry Concepts	
	Basics of Titration and Equilibrium	
Sep. 25, 2017	**First exam**	
	Activity, pH measurement	
	Systematic Treatment of Equilibrium	
	Acid Base Basics, monoprotic, Buffer	
	Acid Base, polyprotic	
Oct. 30, 2017	**Second exam**	
	EDTA	
	Introduction to Instrumental Methods, Electrochemistry	
November 20-24 Thanksgiving Break	***No lecture / lab meeting***	
	Electrochemistry, review	
Class Starts August 21. Class Ends: December 4 (November 29). ***Final exam: December 11 (Monday), 16:15 – 18:45PM, Classroom South 105*** ***(Grades due Dec. 15)***		

Grade Scale:
Tentative cutoffs are: A+: 95%; A: 90%; A-: 85%; B+: 80%; B: 75%; B-: 70%; C+: 65%; C: 60%; C-: 55%; D: 50%; and F: below 50%.

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.

The last day to withdraw with a W is October 10, 2017.
Due dates of papers: see the lab syllabus.

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.