

**Course Syllabus
Chemistry 141 - TPSL
Spring 2008
Oxford College of Emory University**

Class Meets MW, 3:30-4:45, Th 2:30-5:30 Room 223 Pierce

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What is a Liberal Arts Education?

A liberal arts education is an interdisciplinary education including courses in humanities, natural sciences, social sciences, and physical education.

Why Pursue a Liberal Arts Education?

This course aims to use chemistry as a springboard into a liberal arts education by helping YOU develop your human capacities, that is the “qualities, capacities, domains, and/or dispositions native to us as human beings that allow education to occur in the first place.”* Marshall Gregory, Ice Professor of English, Liberal Education, and Pedagogy at Butler University, breaks down these capacities into eight categories:

- 1) Language
- 2) Reason
- 3) Imagination
- 4) Introspection
- 5) Aesthetic Responsiveness
- 6) Moral and Ethical Deliberation
- 7) Sociability
- 8) Physicality

One may see the goal of a liberal arts education as the advanced development of all of these human capacities. By doing so, YOU will be better equipped to live an “autonomous, socially responsible, intellectually perspicuous, and morally defensible life.”¹

¹Marshall Gregory, “Forgetting, Learning, and Living: A Pedagogical Theory of How Education Makes a Difference Even Though We Forget Most of What We Learn” 2006.

Course Description

Chemistry 141 is the first course in a two-semester sequence for General Chemistry. This class fulfills one half of the introductory chemistry requirement for science majors at Emory University. It can also be taken by non-science majors to complete their laboratory science general education requirement. The topics covered in CHEM 141 include: 1) experimental design and measurement; 2) fundamental properties of matter; 3) states of matter and the properties of gases; 4) aqueous solutions; 5) chemical reactions; 6) energy and thermochemistry; and 7) environmental sustainability.

Course Goals

The general goal of CHEM 141 is to provide an introduction to the study of matter and the various changes it can undergo and to demonstrate how/why the study of chemistry is relevant to YOUR life. In the course of completing this goal, the various concepts of chemistry that are discussed will aid in developing your human capacities and contribute to your liberal arts education. More specifically, by completing the ground-level ozone study, you will: 1) begin to develop problem solving and critical thinking skills; 2) become better acquainted with experimental design (including data collection and analysis); 3) practice effective communication; and 4) show you how a chemist can solve a real problem and reveal the interdisciplinarity of a social issue such as air quality.

Materials and Resources

- Textbook: Chemistry, 8th or 9th edition, Chang (required)
- Student study guide and solutions manual (accompaniment to textbook; optional)
- Carbon-copy lab notebook (required)
- Safety Glasses (required)
- Non-graphing scientific calculator (required)
- PRS Interwrite Remote (required)
- Blackboard Class Conference – General Chemistry with Lab (<https://classes.emory.edu/webapps/portal/frameset.jsp>)
- Emory email (ex: jeichle@emory.edu)

Grading

Your grade will be broken down into the following categories:

Attendance	5%
Exam 1 (Unit 1 and 2)	15%
Exam 2 (Unit 3 and 4)	15%
Exam 3 (Unit 5 and 6)	15%
Final Exam (cumulative) ¹	15%
Laboratories	20%
Ground Level Ozone Paper	10%
Ground Level Ozone Presentation	5%

¹Your final exam can be used to replace your lowest exam grade.

Attendance

You will be given 2.5 points for each class period you attend. There are 41 class meetings in the semester, so you can accumulate a total of 102.5 points. Attendance will be taken at 3:30 pm (MW) or 2:30 pm (Th) sharp; if you are not present when the attendance is taken, you do not receive the attendance points.

Laboratories

You will do 7 labs in the course of completing Chapters 1-11:

- 1) Experimental Design Lab (formal report)
- 2) Atomic Spectra Lab (report sheets)
- 3) Lewis Structure Dry Lab (problem sheet)
- 4) Imploding Can Lab (formal report)
- 5) Stoichiometry Lab (formal report)

- 6) Redox Titration (report sheets)
- 7) Calorimetry Lab (report sheets)

Guidelines for the lab report sheets and formal summaries will be provided in separate documents.

*Note: If you complete all of the SALG surveys, your lowest lab grade will be dropped. Missed labs due to absence CANNOT be made up and will result in a grade of 0 (if you miss class during a laboratory experiment, you cannot hand in a report sheet or formal summary for that lab).

Course Reflection Statements

If you complete both of the course reflection writing assignments, you will get to add 5 points to your lowest exam grade. Details about these writing assignments will be given when these are assigned.

Ground-level Ozone Project – TPSL*

Each student will complete a ground level ozone detection study by working in a collaborative group with three other students. The initial problem will be given to you in the form of a case study. Once the major learning goals have been identified in the case study, each group will research the necessary background information required to address the major learning objectives. Included in this will be why ground-level ozone in Newton County needs to be measured and how one could actually go about measuring it. Each group will then construct ground-level ozone detectors and design an experimental protocol for collecting ozone concentration data. Subsequently, each group will write a report that summarizes all of the pertinent background information, as well as the ozone concentration data and analysis. This report will be given to the local environmental agency Keep Covington/Newton Beautiful. The ground-level ozone project will be graded based on the evaluation of the written report and student self-evaluations.

*Each group will give a presentation about the background of ground level ozone, do one data collection, and then summarize the results of our field work in collaboration with students from Cousins Middle School. This will be done during normal class time, so no out-of-class volunteer work will be required to complete the TPSL portion of this course.

Final letter grades will be assigned as shown below:

A	(93-100%)
A-	(90-92%)
B+	(87-89%)
B	(83-86%)
B-	(80-82%)
C+	(77-79%)
C	(73-76%)
C-	(70-72%)
D+	(67-69%)
D	(60-66%)

Honor Code

It is assumed that all Oxford College students will adhere to the highest standards of academic honesty and will uphold the Oxford College Honor Code.

Specific things to keep in mind for CHEM 141:

- you are expected to do your own work when taking an exam.
- only a non-programmable calculator, pencil, and other pre-approved documents are permitted in the exam.
- no cell phones are allowed in class during an exam period.
- all work handed in for lab must be done as an individual unless otherwise stated by the lab instructor.
- any idea or thought used in a laboratory assignment must be properly referenced.
- even though you may collect data in groups, you are not to collaborate with other students when completing lab report sheets.

It is my duty, according to the Honor Code, to report any incidences of misconduct to the Honor Council. Anyone who is found guilty of violating the Honor Code may receive a grade of F for the course. It is strongly recommended that each student carefully read through the Oxford College Student Honor Code.

Tentative Schedule (Book chapters from Chang, 8th edition)

Week 1: Chapter 1 (units, dimensional analysis, experimental design)

Week 2: Chapter 2.1-2.3, Chapter 7 (atomic structure, electron configurations)

Week 3: Chapter 8 and 2.4 (periodic trends)

Week 4: Chapter 9 and 2.5-2.7 (chemical bonding and Lewis structures, formulas and names)

Week 5: Chapter 9 and 2.5-2.7

Exam I

Week 6: Chapter 10 (molecular geometry and dipoles)

Week 7: Chapter 11 (intermolecular forces)

Week 8: Chapter 5 (gas laws)

Exam II

Week 9: Chapter 3 (moles and stoichiometry)

Week 10: Chapter 4 (chemical reactions and aqueous solutions)

Week 11: Chapter 4

Week 12: Chapter 6 (thermochemistry)

Exam III

Week 13: Ground Level Ozone Detection Study

Week 14: Ground Level Ozone Detection Study

Week 15: Ground Level Ozone Detection Study

Final Written Report for Ground Level Ozone Detection Study due April 29

Final Exam: Thursday, May 1, 7-10 pm