General Chemistry C1403x, Fall 2005

M/W 1:10-2:25 PM

Instructor: Professor Nicholas J. Turro

Office 768 Chandler

Email: njt3@columbia.edu

Phone: 212 854 2175 or 212 854 3017

All of this information is on the course home page in courseworks: https://courseworks.columbia.edu/

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<tr>
<th>Monday</th>
<th>Tuesday</th>
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<tr>
<td>10-10:50 AM</td>
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<td>(023)</td>
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<td>Marissa Solomon</td>
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<td>307 Pupin (023)</td>
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<td>11-11:50 AM</td>
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<td>Marissa Solomon</td>
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<td>307 Pupin (024)</td>
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<td>1:10-2 PM</td>
<td>(022) Jeremiah Johnson</td>
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<td>501 B International Affairs</td>
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<td>3:10-4 PM</td>
<td>(019) Marissa Solomon</td>
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<td>(021) Jeremiah Johnson</td>
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<td>424 Pupin</td>
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<td>4:10-5 PM</td>
<td>(020) Jeremiah Johnson</td>
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Ms. Marissa Solomon (ms2201@columbia.edu)
Mr. Jeremiah Johnson (jaj2109@columbia.edu)
YOU MUST BE REGISTERED for one of the six recitation sections for this course. *The purpose of the recitation section is for you to go over homework problems, ask questions, take quizzes, meet other students, organize study groups, prepare for the exams.*

If you are not registered for one of these sections, you are not registered for this course and you will not receive a grade. Please see your TA if you are not registered for one of the listed recitation sections.

**Diagnostic exam this week. Recitations next week.**

This standardized national examination will *not* be used in computing the term grade. However, an exceptional score might decide a borderline computation in your favor.

If you have not taken the diagnostic exam please contact Socky Logo (sl27@columbia.edu). She’ll give you instructions on how to be assigned a time and place to take the exam.
EXAM SCHEDULE

Exam 1  Wednesday  September 28
Exam 2  Wednesday  November 2
Exam 3  Wednesday  November 30

Final Exam:  Scheduled by the registrar (not me)

Grade will be based on 5 class exam equivalents. A maximum of 500 points (plus a few extra points). See syllabus for details.

There are no makeup exams. If you miss an exam, that one will be dropped. If you miss more than one exam you will not receive a grade for the course.
Tentative coverage of Text: Oxtoby, Freeman and Block, Chemistry: Science of Change

Chapters

1. The Atomic Nature of Matter (review of stuff you had in high school).
2. Stoichiometry (how to count atoms by weighing them).

Exam 1: Wednesday, September 28 (After 6 lectures).

15. Nuclear Chemistry (nuclear structure and nuclear properties).
16. Quantum Mechanics and the Hydrogen Atom (atoms as waves).
17. Many-electron Atoms and Chemical Bonding (how waves interact).

Exam 2: Wednesday, November 2 (9 lectures)

19. Coordination Complexes (chemistry of metals, the inorganic world).
24. From Petroleum to Pharmaceuticals (chemistry of organic molecules, the organic world).

Exam 3: Wednesday, November 30 (6 lectures)

Period before final (3 lectures)

25. Synthetic and Biological Polymers (chemistry of giant molecules and life).
Courseworks: https://courseworks.columbia.edu/

When sending Email, please place in the Subject field: Chemistry C1403

Office hours for Prof. Turro: 2:30-3:30 PM M/W or by appointment

TA office hours will be announced on the course home page.

All queries concerning course administration to the Undergraduate Office: 340 Havemeyer (located to the right as you leave 309 Havemeyer)

Ms. Socky Lugo (sl27@columbia.edu)

Ms. Daisy Melendez (dm55 sl27@columbia.edu)
Who are you?
180 (or so) bright and eager students!

Who am I?

Professor of Chemistry
Specialist in Photochemistry, Suprorganic Chemistry and Spectroscopy
Web site: turroserver.chem.columbia.edu
BA, Wesleyan University, 1960
PhD, Caltech, 1963
Postdoc, Harvard, 1963
Professor, Columbia, 1964
Can you find Nick and Sandy Turro in this picture?
Chapter 1: The Atomic Nature of Matter.

Atomic Theory of matter: How it came about from laws based on simple observations.

The Mole Concept: Counting and weighing atoms and molecules.
Chapter 2: Stoichiometry

(1) Writing balanced chemical equations

(2) Using balanced chemical equations

(3) Computing yields and determining limiting reagents
Chapter 3: Periodic Table and Molecular Structure

(1) Periodic properties of the elements and the periodic table

(2) Lewis structures for describing the bonding of atoms in molecules

(3) The shapes and dipole moments of molecules
# IUPAC Periodic Table of the Elements

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**Key**
- **atomic number**: standard atomic weight
- **symbol**: chemical symbol

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**Notes**
- Aluminum and cesium are commonly used English-language spellings for aluminum and caesium.
- IUPAC 2001 standard atomic weights (mean relative atomic masses) are listed with uncertainties in the last figure in parentheses [R. D. Lias, Pure Appl. Chem. 75, 1107-1122 (2003)].
- These values correspond to current best knowledge of the elements in natural terrestrial sources. For elements with no IUPAC assigned standard value, the atomic mass (in unified atomic mass units) or the mass number of the nuclide with the longest known half-life is listed between square brackets.
- Element with atomic number 111 has not yet been named. The IUPAC provisional name is shown.
- Elements with atomic numbers 112, 114, and 116 have been reported but not fully authenticated.

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Copyright © 2003 IUPAC, the International Union of Pure and Applied Chemistry. For updates to this table, see http://www.iupac.org/reports/periodic_table/. This version is dated 7 November 2003.
The periodic table where did it come from? The BIG bang!
Chemistry is about matter and light, their interactions and transformations.

All of which was created by the “Big Bang” about 10 billion year ago.

As the result of the Big Bang, the atoms of the elements contained in the Periodic Table were produced.

Understanding the underlying intellectual structure of the Periodic Table is an important goal of this course.

So, let take a look at a preview of coming attractions for the course.