Lehman College  
City University of New York  
Department of Chemistry

General Chemistry I      CHE-166  
Spring - 2011

Instructor  
Professor Andrei Jitianu –PhD

Office Hours: Tuesday & Wenesday 11:30-12:30  
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Course Description  
CHE-166 - General Chemistry I  
Two lectures are offered twice per week - Monday and Wednesday 4:30-5:45 pm (6:00pm)  
3 hours / 3 credits  
This course is presenting the fundamental laws and theories of chemistry in considerable depth. The aim of this class is to provide a broad overview of the principles of chemistry, the reactivity of the chemical elements and their compounds and the applications of chemistry.

Prerequisites  
Completion of the College's Requirement in Mathematics and a satisfactory score on the Departmental Placement Examination.  
Corequisites: CHE 167. A student may receive credit for only one of the following: CHE 104 and 106, 114, 136, and 166.

Place of course in degree program  
This course is a degree program requirement for Chemistry, Biochemistry and Biology program. This course is recommended to pre-medical, pre-veterinary, and pre-dental students.

Academic or Learning Objectives  
Student Learning Outcomes: After completing this course students should be able to:

- Carefully state and be able to apply the major basic concepts of chemistry. To make the difference between atoms, molecules and ions.
- Understand the chemical reactions, to be able to balance the chemical and redox equations and to operate with stoiochiometry concepts and pH scale.
- Be able to apply the concepts of energy and thermodynamics. Understand the structure of the atoms, to apply the notions of Quantum numbers and orbitals.
- Understand structure of atoms and periodic trends and electron configuration and connect these with chemical properties.
- Understand the chemical bond concept and to operate with Orbitals, Theory of Chemical bonding, Valence Bond theory, and molecular Orbital Theory.
- Be able to write chemical equations in a precise, effective, and understandable way.

Required Readings  
Course Requirements and Grading
For this class there will be 3 regular exams and a Final exam. The final grade will be established as follows:

Exams 1 to 3 - 60%:
Final exam - 40%

Each student’s grade will be determined by counting each regular exam as 20% of the final grade and the final exam as 40% of the final grade. In the event a student misses a regular exam, the 20% for that exam will be included in the final exam. In other words, if a student were to miss Exam 2, each of the remaining 2 exams would count for 20% each of the final grade and that student’s final exam would count 60%. A student cannot miss more than one exam (Exams 1 to 3). No make-up exams will be given.

Attendance Policy
Students should be present at every class. A student cannot miss more than one regular exam. For the final grade the presence at the Final Exam is compulsory.

Accommodating Disabilities
Lehman College is committed to providing access to all programs and curricula to all students. Students with disabilities who may need classroom accommodations are encouraged to register with the Office of Student Disability Services. For more information, please contact the Office of Student Disability Services, Shuster Hall, Room 238, phone number, 718-960-8441.

The Academic Center for Excellence (ACE) the Science Learning Center (SLC) and Office of the Supplemental Instruction and Technology (SI)
The Academic Center for Excellence (ACE) and the Science Learning Center (SLC) are two of the tutoring centers on campus. Beside these the Supplemental Instruction and Technology (SI) offer also tutoring through their SI leaders. The ACE provides appointment based and drop-in tutoring in the humanities, social sciences, and writing, as well as general writing and academic skills workshops. The SLC provides drop-in tutoring for natural and computer science courses. The SI provides tutoring for natural science courses. To obtain more information about the ACE and the SLC, please visit their website at http://www.lehman.edu/issp, or please call the ACE at 718-960-8175, and the SLC at 718-960-7707. To obtain more information about the SI program please visit their website http://www.lehman.edu/supplemental-instruction/index.php or contact the SI leaders which are presented in your classroom.

Classroom Policy:
Food policy: Food and drinks are not allowed in the classroom.
Cell Phone Policy: Cell phones are disruptive, even in vibrate mode. Make sure your cell phones are in silent mode before class starts. Text-messaging during class is also highly disruptive (besides absolutely rude) and is forbidden. If a cell phone rings
during class, lecture will be stopped, until the student will shut down the device and the following penalties are applicable

5 pts penalty if your cell phone rings while I am in class; 10 pts penalty if you continue the disturbance (e.g., by letting it ring again); 15 pts penalty for 1st ring on 2nd occasion;

**Electronic devices Policy** No electronic devices can be used or kept accessible during examinations; this includes, but is not limited to i-Phones, cell-phones, beepers, iPods, MP3 players, tape-recorders, PDAs, **bluetooth** and other computing or music devices. Only **basic** calculators will be allowed.

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**Academic Integrity**

While honest scholarship is time-consuming and often requires hard work, it is also the primary process by which students learn to think for themselves. Faculty members must teach respect for methods of inquiry within the various disciplines and make assignments that will encourage honest scholarship; students in turn must uphold a standard of honesty within the College, thereby affirming the value and integrity of their Lehman degree. The following definitions and procedures govern cases involving undergraduate student work.

The most common forms of academic dishonesty are cheating and plagiarism. Cheating is the use or attempt to use unauthorized material, information, notes, study aids, devices, or communication during an academic exercise (for example, using unauthorized books, papers, or notes during an examination; or procuring, distributing, or using unauthorized copies of examinations). Plagiarism means the failure to give credit for the source of another's words or ideas, including but not limited to books, articles, interviews, and multimedia and electronic sites, or—as in the use of borrowed or purchased papers—passing off another person's work as one's own. (Section 213-b of the New York State Education Law prohibits the sale of term papers, essays, and research reports to students enrolled in a college.) Common forms of cheating and plagiarism are highlighted in this Bulletin.

Academic dishonesty is a serious violation of the accepted values of the College. When questions of a breach of academic integrity arise, instructors will inform the students of their suspicions and provide the student with a Faculty Report Form for Incidents of Suspected Academic Dishonesty. The instructor must remember that a student's failure to respond to charges of academic dishonesty is not in and of itself an indication of guilt. The report will include an explanation of the incident, the instructor's intended academic sanction, and an indication whether or not the instructor is recommending that the College undertake disciplinary proceedings pursuant to Article 15 of the Board of Trustees Bylaws.

Academic sanctions may include but are not limited to the following:

1. **a grade of F for the course.**

Disciplinary procedures are governed by Article 15 of the Board of Trustees Bylaws. In the event the student is found guilty of academic dishonesty by a Faculty-Student Disciplinary Committee, penalties that may be imposed include but are not limited to: 1) suspension from the College or 2) expulsion from the College. Although the Office of the Vice President for Student Affairs will be guided by the recommendation of the instructor, it reserves the right to seek disciplinary sanctions under the disciplinary procedures.

Should the instructor become convinced that the suspicions are unfounded, no further action will be taken and the Faculty Report Form will be destroyed. If the suspicions are founded and if both the student and the
instructor are willing, they may agree upon a resolution. Subsequently the instructor will present the completed Faculty Report Form, including the charges and resolution, to the department chair who must forward the appropriate copies of the form to the Office of Academic Standards and Evaluation, and the Office of the Vice President for Student Affairs. If no agreement is reached, the instructor must allow a student to complete all coursework until the following appeal process has been completed.

- The first step in the appeals process is for the instructor to file the Faculty Report Form with the chair. If the term is completed, the instructor may assign a grade that reflects the intended sanction but must also provide a final grade that does not include the intended sanction if the charges are not upheld.
- If the charges are for cheating, then the chair will submit the charges to the Office of the Vice President for Student Affairs. If the charges are for plagiarism, the chair will appoint a committee of three Lehman College faculty members, which will adjudicate the matter within three weeks by majority vote. If the chair is the instructor in question, the senior member of the department Personnel and Budget Committee will act for the chair. The committee will provide written notification of its decision to the chair, who will forward this recommendation and the Faculty Report Form to the Office of the Vice President for Student Affairs.
- The Office of the Vice President for Student Affairs will review the recommendations of the instructor and the committee for possible disciplinary sanctions and provide a written notification of its decision to the department chair, the student, the instructor, and the Office of Academic Standards and Evaluation. Either the instructor or the student has the right, within three weeks of receipt of notification, to appeal the department decision in writing to the Committee on Admissions, Evaluation, and Academic Standards, which will act as adjudicator of last resort. Should any part of the three-week period fall outside the regular semester, the first three weeks of the next regular semester shall apply.

The Office of Academic Standards and Evaluation will keep all records of such proceedings on file until the student's graduation, at which time they will be destroyed.

As a result of a second upheld charge of academic dishonesty, disciplinary procedures will be pursued by the Office of the Vice President for Student Affairs as governed by the procedures under Article 15 of the Board of Trustees' Bylaws.

The following definitions and examples are adapted from the CUNY Policy on Academic Integrity.

**Cheating** is the unauthorized use or attempted use of material, information, notes, study aids, devices, or communication during an academic exercise. Examples of cheating include, but are not limited to the following:

- Copying from another student during an examination or allowing another student to copy your work.
- Unauthorized collaboration on a take-home assignment or examination.
- Using illegal notes during a closed-book examination.
- Taking an examination for another student, or asking or allowing another student to take an examination for you.
- Changing a graded exam and returning it for more credit.
- Submitting substantial portions of the same paper for more than one course without informing each instructor.
- Preparing answers or writing notes in a blue book (exam booklet) before an examination.
- Allowing others to research and write assigned papers or do assigned projects, including the use of commercial term paper services.
- Giving assistance to acts of academic misconduct or dishonesty.
- Fabricating data (all or in part).
- Submitting someone else's work as your own.
Unauthorized use during an examination of any electronic devices, such as cell phones, palm pilots, computers, or other technologies to send or retrieve information.

**Plagiarism** is the act of presenting another person's ideas, research, or writings as your own. Examples of plagiarism include, but are not limited to the following:

- Copying another person's actual words without the use of quotation marks and citations.
- Presenting another person's ideas or theories in your own words without acknowledging the source.
- Using information that is not common knowledge without acknowledging the source.
- Failing to acknowledge collaborators on assignments.
- Purchasing or downloading term papers online.
- Paraphrasing or copying information from the Internet without citing the source.
- "Cutting and pasting" from various sources without proper attribution.

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**Course topics**
The following topics will be covered:

*Basic Concepts of Chemistry; Atoms, Molecules, and Ions; Chemical reactions; Stoichiometry: Quantitative Information About Chemical Reactions; Principles of Chemical reactivity: Energy and Chemical Reactions; The structure of Atoms; The structure of Atoms and Periodic Trends; Bonding and Molecular structure; Orbital Hybridization and Molecular orbitals.*

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**Homework Exercise:** At the end of this syllabus a list of problems for each chapter is given.
Please Note: This schedule is subject to minor change so that course material can be best presented. **All reading assignments are to be completed before class.**

<table>
<thead>
<tr>
<th>Nr.</th>
<th>Crt.</th>
<th>Lecture Topic</th>
</tr>
</thead>
</table>
| 1.  |      | **Chapter 1. Basic Concepts of Chemistry**  
Classifying Matter  
Elements and Atoms  
Compounds and molecules |
| 2.  |      | Physical properties  
Physical and chemical changes  
Units of measurement |
| 3.  |      | Making measurements  
Mathematics of Chemistry |
| 4.  |      | **Chapter 2. Atoms, Molecules, and Ions**  
Atomic structure  
Atomic number and Atomic mass;  
Atomic weight |
| 5.  |      | The periodic table  
Molecules, Compounds, and Formulas |
| 6.  |      | Molecular compounds: Formulas and names  
Atoms, molecules, and the moles |
| 7.  |      | Atoms molecules, and the moles  
Describing Compound Formulas |
| 8.  |      | **Exam 1** |
| 9.  |      | **Chapter 3. Chemical reactions**  
Introduction to chemical Equations  
Balancing Chemical Equations  
Introduction to chemical equilibrium  
Chemical reactions in Aqueous Solutions |
| 10. |      | Ions and molecules in Aqueous Solutions  
Precipitation reactions  
Acids and bases |
| 11. |      | Gas-Forming reactions  
Oxidation-reduction Reactions  
**Chapter 20. Principles of Chemical Reactivity: Electron Transfer reactions**  
Oxidation-Reduction reactions |
| 12. |      | **Chapter 4. Stoichiometry: Quantitative Information About Chemical Reactions**  
Stoichiometry  
Reaction in which one reactant is present in Limited Supply  
Chemical Equations and Chemical Analysis |
| 13. |      | Concentrations of Compounds in Solution  
\( \text{pH}, \ \text{a Concentration Scale for Acids and Bases} \)  
Stoichiometry of the reactions in aqueous solution  
Spectrophotometry |
(Skip 5.6 Calorimetry) |
| 15. | The first law of Thermodynamics  
Enthalpy Changes for Chemical Reactions  
Enthalpy calculations -Hess’s Law |
| 16. | **Exam 2** |
| 17. | **Chapter 6. The structure of Atoms**  
Electromagnetic Radiation;  
Quantization |
| 18. | Atomic line Spectra and Niels Bohr  
The modern View of electronic Structure: wave or quantum mechanics; |
| 19. | The Shapes of Atomic Orbitals  
Electron spin |
| 20. | **Chapter 7. The structure of Atoms and Periodic Trends**  
The Pauli Exclusion Principle  
Atomic Subshell Energies and Electron Assignments |
| 21. | Electron configuration  
Electron Configuration of Ions |
| 22. | Atomic properties and Periodic Trends  
Periodic trends and Chemical properties |
| 23. | **Chapter 8 Bonding and Molecular structure**  
Chemical Bond Formation  
Covalent Bonding and Lewis structure  
Atom formal Charges in Covalent Molecules and Ions |
| 24. | Resonance  
Exceptions to the octet rule  
Molecular Shapes |
| 25. | Bond Polarity and Electronegativity  
Bond and Molecular Polarity  
Bond Properties: Order, Length, Energy |
| 26. | **Exam 3** |
| 27. | **Chapter 9. Bonding and Molecular structure: Orbital Hybridization and Molecular orbitals**  
Orbitals and Theories of Chemical Bonding  
Valence Bond Theory |
| 28. | Molecular Orbital Theory |
| **Final exam** |
## Homework

<table>
<thead>
<tr>
<th>Chapter / page</th>
<th>Homework Exercises</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 / page 20</td>
<td>1, 2, 4, 5, 7, 8, 9, 10, 11, 18, 19, 21, 23, 29, 30, 31, 33, 34</td>
</tr>
<tr>
<td>1 / page 43</td>
<td>1, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 31, 33, 34, 35, 36, 37, 40, 41, 42, 43, 47, 48, 49, 50, 51</td>
</tr>
<tr>
<td>2 / page 100</td>
<td>1, 2, 3, 5, 7, 8, 10, 12, 13, 15, 17, 19, 20, 21, 22, 23, 24, 27, 28, 29, 31, 33, 34, 36, 37, 41, 42, 43, 45, 46, 47, 49, 50, 51, 52, 53, 54, 55, 57, 59, 60, 62, 63, 66, 68, 69, 71, 72, 73, 74, 76, 78, 80, 82, 84, 89, 99, 105, 109, 115, 129, 133</td>
</tr>
<tr>
<td>3 / page 152</td>
<td>1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 17, 19, 20, 21, 22, 24, 26, 27, 28, 33, 34, 36, 37, 39, 41, 42, 43, 44, 45, 46, 47, 48, 50, 51, 52, 54, 55, 57, 60, 63, 65, 66, 67, 68</td>
</tr>
<tr>
<td>4 / page 195</td>
<td>1, 2, 3, 4, 5, 7, 8, 11, 12, 14, 15, 19, 20, 23, 25, 26, 30, 31, 34, 35, 36, 37, 38, 39, 40, 43, 45, 46, 47, 48, 57, 58, 60, 62, 65, 67, 68, 71, 74, 75, 77, 78, 80, 81, 82, 83, 97, 106, 117</td>
</tr>
<tr>
<td>20.1</td>
<td>1, 2, 3, 4, 5, 6</td>
</tr>
<tr>
<td>5 / page 242</td>
<td>2, 7, 8, 10, 12, 13, 14, 16, 17, 18, 20, 21, 22, 26, 28, 29, 30, 43, 44, 45, 46, 47, 48, 52, 53, 54, 56, 58, 59, 60, 61, 62, 69, 79, 80</td>
</tr>
<tr>
<td>6 / page 297</td>
<td>1, 3, 4, 5, 7, 8, 10, 11, 12, 14, 16, 18, 19, 23, 25, 26, 27, 28, 30, 31, 33, 34, 35, 37, 40, 42, 44, 46, 47, 50, 51, 53, 56, 57, 58, 61, 62, 63, 66, 67, 68, 69</td>
</tr>
<tr>
<td>7 / page 332</td>
<td>1, 2, 3, 6, 7, 8, 9, 10, 11, 12, 13, 15, 16, 18, 19, 20, 21, 23, 24, 26, 27, 28, 30, 32, 33, 34, 35, 36, 37, 39, 40, 41, 44</td>
</tr>
<tr>
<td>8 / page 395</td>
<td>1, 2, 3, 4, 5, 6, 7, 8, 10, 12, 13, 14, 15, 16, 17, 18, 20, 21, 22, 23, 24, 26, 27, 28, 30, 32, 34, 36, 38, 40, 41, 42, 44, 45, 53, 56, 58</td>
</tr>
<tr>
<td>9 / page 434</td>
<td>2, 3, 5, 6, 7, 8, 9, 12, 15, 16, 18, 19, 21, 22, 23, 24, 27, 28, 29, 32, 34, 35, 36, 40, 42</td>
</tr>
</tbody>
</table>