CHEMISTRY 140
General Chemistry I
FALL SEMESTER 2007

Lecturer:	**Dr. Craig C. McLauchlan**
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Lecture Hours:	**Section 1:** M, W, F 10:00-10:50 pm in Moulton 208 **Section 14:** M, W, F 2:00-2:50 pm in Moulton 208
Office Hours:	As posted on course web page or by appointment (via e-mail or phone call)
Tutorials:	Departmental tutor available in Julian 211, Times TBA
General Help Session:	Wednesday 3:00-5:00 pm, MLT208, with Dr. McLauchlan
Required Textbook:	Brown, LeMay and Bursten, ***Chemistry: The Central Science,*** 10th Edition, Prentice Hall, (ISBN: 0131464892). If your textbook comes with a media companion, I encourage you to use it.
Required Lab Manual:	L. Szczepura. ***Illinois State University Chemistry 140 Manual,*** 4th Edition, (ISBN 1-58874-641-0)
Required Devices:	Student Response Device, RF, Turning Technologies. Lab glasses/goggles.
Recommended Texts:	R. Wilson, *Solutions to Exercises* (ISBN: 0-13-009798-5) J. Hill, *Student's guide* (ISBN: 0-13-009795-0)
Course URL(Web Page):	http://www.ilstu.edu/~ccmclau/che140/ (old, but sometimes useful) https://webct.ilstu.edu (most items will be in WebCT)

Course Objective:
At the end of the semester the student will be able to describe chemical systems through the usage of basic chemical nomenclature, chemical reactions and the periodic table. In addition the students will be able to understand the principles of chemical bonding as well as the basic thermodynamic principles.

Course Description
The course consists of three 50 minute lectures and one 170 minute laboratory session per week.
Each student is fully responsible for her/his own performance. Therefore, you are encouraged to keep up to date with the lectures, readings, homework, and laboratory issues.

Attendance Rules:

Lectures: Your attendance of lectures is expected and encouraged. This will be highly beneficial to you at the end of the semester. The material presented in the lectures is the core of the course and will be the bulk of the examinations. Reading and Homework assignments will be made during lectures regularly and will be posted in the course web site. You will also receive information relevant to your laboratory session. Also, please note the comment at the end of this syllabus that you are responsible for all announcements made in lecture. Attendance in class will also allow you to participate in in-class quizzing, which can boost your grade in the class. Be sure to bring your Student Response Device (*aka* Clicker) to each class period. You are responsible for being sure that it is functioning and that the batteries are not dead.

Material to be covered in this course is that of Chapters 1 to 11 of your text, not strictly in that order:

Chapter 1. Matter and Measurements: Substances, mixtures, compounds, elements, physical and chemical change, units, measurements, dimensional analysis.

Chapter 2. Atoms and Molecules: Atomic theory, atomic structure, the periodic table, molecular compounds, ionic compounds, nomenclature.

Chapter 3. Stoichiometry: Chemical equations, chemical reactivity, the mole, chemical composition, atomic and molar mass, quantitative information from balanced equations.

Chapter 4. Aqueous solutions: Ions, solubility, precipitation reactions, acid-base reactions, reduction-oxidation reactions, concentration, stoichiometry

Chapter 5. Thermochemistry: energy conservation law, enthalpy, calorimetry, Hess's law

Chapter 6. Electronic Structure of atoms: light and photons, Bohr's model of the atom, particle-wave duality of matter, quantum theory, atomic orbitals, electron configurations

Chapter 7. Periodic Properties of the elements: Periodic properties and trends

Chapter 8. Basic concepts in chemical bonding: Ionic and covalent bonding, bond polarity, electronegativity, Lewis structures.

Chapter 9. Bonding Theories-Molecular geometries: VSEPR model, molecular polarity, hybridization, multiple bonds, delocalized bonds, molecular orbital theory

Chapter 10. Gases: Properties, ideal gases, gas laws, real gases

Chapter 11. Intermolecular forces: ion-dipole, dipole-dipole, London dispersion forces, Hydrogen bonding, van der Waals interactions, phase changes, phase diagrams, structure of solids and liquids

Laboratory humidus

The *laboratory humidus* experiments reinforce, through experience, some of the concepts you learn during the lecture. It introduces you to scientific apparati, collection of scientific data, and the manipulation of chemical reagents and provides you with an opportunity to rationalize results and draw scientific conclusions about experimental observations. Your laboratory instructor will provide details about safety and laboratory policies in their syllabus. Attendance in the laboratory is mandatory. There will be NO MAKE-UPS for missed laboratories.

Laboratory aridus

The *laboratory aridus* sessions allow you to gain more insight into some of the topics covered during the lecture. The exercises are an interactive opportunity to explore and analyze specific subjects that need more depth and time than that allowed during the lecture time. Attendance and participation in these sessions is mandatory. There will be NO MAKE-UPS for missed laboratories.

GRADING ISSUES

Remember that your grade in this course is solely your responsibility. I will provide a lot of opportunities for you to do well. Your grade will be based on your performance in the following arenas: web-based quizzes, in-class quizzes, a compulsory quiz, 5 exams (four hour exams and a final exam), laboratory exercises, and laboratory reports. In addition, and based on exam performance, I may supply some extra credit assignments.

1. Online quizzes: There will be 15 online quizzes administered weekly. The material covered in each quiz is related to the subject being discussed during the lecture and/or that is assigned for homework. The first week's quiz is a practice one and will not count towards your final grade. It is meant merely to introduce you to the online quiz system "WebCT", which we will use in this course. Of the remaining 14 quizzes only the score of your best 12 quizzes will count towards your final grade. Each online quiz has a value of 6 points. Each quiz can be taken up to three times for score: after every attempt you will receive feedback and you will receive credit for your correct responses. (Only your highest score counts). Each quiz will be available ONLY for one week, so it is your responsibility to keep track of the quiz that is pending for each week. After one week of posting, the quiz will not be available for score and those

students who did not take the quiz will have a zero recorded as their score for that quiz. Please refer to the schedule of online quizzes for due dates.

2. Laboratory quizzes: Quizzes will be administered weekly at the beginning of every laboratory session. Each quiz is worth 6 points. Out of the total number of quizzes taken, only the top 12 scores will count towards your final grade. The instructors are advised to prepare quizzes three to four questions long, in which two of the questions are based on the previous week's online quiz. The third/fourth question(s) are at their discretion. There will be NO MAKE-UP quizzes.

Both online and in-class quizzes account for 144 points, which is ~19% of your final grade, so strong performance is encouraged.

3. Compulsory Quiz: There will be a 25 minute quiz administered *very* early in the semester, which is worth 9 points. This quiz is meant to help determine if you have sufficient fundamentals to succeed in this course. Undergraduates admitted for or after the 2001-2002 academic year can receive credit for both CHEM110 and CHEM140. *Those lacking high school chemistry or that have a weak chemistry background ARE ENCOURAGED to enroll in CHE110, before attempting the CHE140 and CHE141 sequence*. This quiz is intended to help you judge whether you are ready or not ready to take CHE140. The Chemistry Department will work with you to facilitate your move to CHE110 through the second week of classes should you find this is the option that is more viable or desirable for you.
In any case the compulsory quiz is meant as an indicator and your performance on it does not guarantee success or failure in CHE140. The quiz will be administered:

Friday, August 24th

4. Exams: There will be four 100 points, 50 min. in-class "hour" exams on the following dates:

Exam 1	September 14th
Exam 2	October 12th
Exam 3	November 2nd
Exam 4	November 30th

Of these four "hour" exams, your best three scores will count towards your final grade.

The final exam is comprehensive and is worth 160 points. It will be 120 minutes long and will be held:

Thursday, December 13th at 8:00 p.m. in Schroeder 130

THERE WILL BE NO MAKE-UP EXAMS

Exams will consist of OPSCAN scored multiple-choice questions. For each exam bring only a **#2 pencil** and a **scientific calculator** (not programmable, no laptops, no cell phones). A periodic table will be provided.

5. *Laboratory humidus*: There are seven *laboratory humidus* exercises. At the end of each one you will submit a report to your instructor. Each report is worth 15 points. As specified before, there are no make-ups for laboratory exercises, so if you missed the exercise a grade of zero will be recorded unless you provide a valid excuse (see **Other Policies** Section).

6. *Laboratory aridus*: There are seven *laboratory aridus* exercises. At the end of each one you will submit a written exercise to your instructor. Each exercise is worth 6 points. There are no make-ups for laboratory exercises, so if you miss one you will earn a zero unless you provide a valid excuse. (see **Other Policies** Section)

Final Grade: The final grade will be determined through the following algorithm:

	Maximum number	Points each	Maximum points
Online quizzes/Clickers	12	6	72
In-class quizzes	12	6	72
Compulsory quiz	1	9	9
Hour Exams	3	100	300
Final Exam	1	160	160
Laboratory humidus Exercises	7	15	105
Laboratory aridus Exercises	7	6	42
Total			760

The grade scale is:	≥646 pts	A
	570-646 pts	B
	494-570 pts	C
	418-494 pts	D
	<418 pts	F

OTHER POLICIES

1. If the final exam is missed without a valid excuse (medical, legal, domestic emergencies) provided in writing **before** the exam, then the grade for the final exam will be zero and will result in the assignment of a grade of "F" for the course. If you miss the final with a valid excuse, you will receive an incomplete (I) for the course.
2. If you miss one of the hour exams (i.e. not the final exam) with a valid (as defined by the University's policies) excuse the grade of the exam will be **prorated** (not averaged) from all the other exams in the course (including the final exam grade). Owing to the accelerated nature of this course, if a second exam is missed with OR without a valid excuse, a grade of zero will be assigned to that exam. No more than one excusable absence from exams will be allowed.
3. Laboratory and discussion exercises are a very important component of the course. A **minimum** of 10 sessions (including at least 4 laboratory humidus and 4 laboratory aridus sessions) MUST be attended to PASS the course. Failure to comply with this policy will result in a grade of "F" for the course regardless of your exam performance.
4. Homework assignments and any changes made to this syllabus will be announced in class. <u>It is your responsibility to attend every lecture and be aware of any announcements.</u>
5. You are responsible for obeying the safety rules in the laboratory. If you are in violation of any of these rules your instructor and/or TA, will notify you and suggest a compliance procedure. Failure to comply will result in your immediate suspension from the ongoing laboratory exercise and a grade of zero for that exercise.
6. <u>Instructors are autonomous in their decisions regarding grading, and enforcement of safety and laboratory policies</u>. If you miss a discussion or laboratory exercise and have a valid excuse, notify your instructor as soon as possible so he/she can take the appropriate action to assign a grade. Failure to notify may result in a grade of zero for such exercise.
7. Please turn off all cell phones and headphones upon entering class.
8. Students are expected to follow the Student Code of Conduct.
   (http://www.deanofstudents.ilstu.edu/downloads/crr/code-of-student-conduct.pdf)
9. Other policies, including, but not limited to, those regarding Academic Integrity, apply according to the Undergraduate Catalog.

Any student needing to arrange a reasonable accommodation for a documented disability should contact Disability Concerns at 438-5853 (voice), 438-8620 (TT/TDD).

DISCLAIMER: *Any changes to this syllabus will be announced in class, therefore, it is the responsibility of the student to attend every lecture and be aware of any announcements.*