

**Instructors:**

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**Course Information:**

- Lectures on MWF, 10:20-11:10am, in Collier HOSCI 204 (Dana Lecture Hall)
- Problem Session on Tues., either 8:55-9:45am, or 10:20-11:10am in Collier HOSCI 202 (Mellon Lecture Hall)
- Laboratory on either Tues. 12:45-3:45pm, Wed. 1:15-4:15pm, Thurs. 12:45-3:45pm, or Fri. 1:15-4:15pm in Collier General Chemistry Lab 210 (separate lab syllabus)

**Course Materials:**

- Required text: “Chemistry: The Central Science, 12<sup>th</sup> Edition” by Brown/LeMay/Bursten/Murphy/Woodward (ISBN#978-0-321-69672-4)
- Scientific calculator: Required for this course, must do exponents, logs, sci. notation does NOT need to graph does NOT need to be programmable you MUST have one OF YOUR OWN for each quiz/exam
- Optional manual: “Solutions to Exercises in Chemistry: The Central Science, 12<sup>th</sup> Edition” by Wilson (ISBN#978-0-321-70500-6)
- Black Board Site: At <http://blackboard.moravian.edu/> you can enroll in the course page for CHEM113B. Throughout the semester important announcements, lecture documents, and pertinent links will be posted. Please access this site!

**Course Description:**

This is the first semester of a traditional two-semester introductory chemistry sequence. In the first semester of General Chemistry, students will be introduced to the fundamental principles of chemistry as a quantitative science including inorganic reactions, thermochemistry, atomic theory and structure, and properties of gases, liquids and solids. Some prior familiarity with basic material from High School Chemistry is helpful, although prior in-depth knowledge of topics is not expected.

**Goals of the Course:**

Expectations of students completing this course include (but are not limited to) the following:

- Naming simple inorganic salts and simple inorganic compounds (going from name to formula, and from formula to name)
- Solving basic stoichiometric problems involving weight, solutions, and gases in any combinations
- Writing balanced chemical equations for simple reactions, including net ionic equations for reactions in aqueous solution
- Understanding the atomic nature of matter including the components of the atom and the modern theories of their arrangement in the atom
- Understanding the properties of atoms and explaining these properties in terms of atomic interactions
- Understanding the basic heat transformations in chemical systems
- Drawing Lewis structures for simple inorganic molecules from a chemical formula and predicting the 3D geometry and hybridization around an atom

- Understanding the bulk properties of matter and the intermolecular reactions that lead to these properties

**Attendance Policy:**

Your presence is welcome and expected in all course meetings (class, problem sessions, and laboratories). As a reminder, the college policy on attendance can be found at <http://www.moravian.edu/studentLife/handbook/academic/academic.html>. If you anticipate an unavoidable absence (due to an extenuating circumstance that is documented by an academic dean or health professional), please notify the instructor as soon as possible. You are responsible for providing documentation and making arrangements in a timely manner or else a grade of zero will be assigned for missed work.

**Academic Honesty Policy:**

Please be familiar with the college policy on academic honesty that applies to this course (<http://www.moravian.edu/studentLife/handbook/academic/academic2.html>). In addition, throughout this course, each student may exchange experimental details and data with her/his lab partner and classmates. However, any work submitted in your name is to be your work alone. You may discuss work with others on assignments and labs, but merely copying answers is not acceptable.

**Cell Phone Policy:**

Please have the courtesy to turn off/not use/not answer your cell phone during course meeting times. For quizzes and exams, cell phones MUST be put away out of sight (in your backpack, NOT your pocket) or else a score of zero will be assigned by your instructor.

**Getting Course Help:**

If you are having difficulties, don't wait to get help! You can....

- Stop by either instructor's office during office hours with questions
- Attend general chemistry tutoring sessions (Wed. & Thurs. 7-9pm – CHOS Room 207)
- Contact your instructor by email or phone to make an appointment for review
- Request a peer tutor at Learning Services (office phone: 610-861-1510, 1307 Main St)

Students who wish to request accommodations in this class for a disability should contact Elaine Mara, Assistant Director of Learning Services for Academic and Disability Support at 1307 Main Street, or by calling 610-861-1510. Accommodations cannot be provided until authorization is received from the Academic Support Center.

**Your Homework Journal:**

Homework problems/exercises will be assigned for the material covered in each class meeting. Please work through these problems in your homework journal. These problems will not be graded and are intended to provide you with the minimum exercises to review important concepts in that chapter. You will be allowed to use your homework journal as a resource during the quizzes and exams this semester as long as you follow these rules:

- Only problems from the required text and from class activities can be in your journal
- No loose papers, photocopied material or sticky notes are allowed in the journal
- All journal pages must be numbered (these can be written by hand when you first purchase the notebook). No pages should be removed. Put a simple X through errors.
- Should you choose to use your homework journal as a resource during a quiz or exam, it must be handed in with your test. Journals with extra information, missing pages, or scratched out words may result in lost points for that test.

**Grading:**

Your grade in this course does not depend on the grade of any other student in the class. Instead, your letter grade will be determined by the percentage of total possible points you earn in this course, according to the following scale:

Percentage	Letter Grade
93-100	A
90-92	A-
87-89	B+
83-86	B
80-82	B-
77-79	C+

Percentage	Letter Grade
73-76	C
70-72	C-
67-69	D+
63-66	D
60-62	D-
< 60	F

The total number of possible points in this course is *anticipated* to be as follows:

I.	Exams (4@125pts each)	500pts
II.	Optional Quizzes (125pts total)	
III.	Problem Sessions	100pts
III.	Final Exam	200pts
IV.	Laboratory	200pts
	<u>Total for Course</u>	<u>1000pts</u>

**I. Exams:** Four exams will be given in class during the semester. These exams will be administered during lecture time on September 21<sup>st</sup>, October 12<sup>th</sup>, November 7<sup>th</sup>, and November 30<sup>th</sup>. There will be no exceptions on exam times and no makeup exams are given.

**II. Quizzes:** Regular quizzes will be given throughout the semester during class or problem session meeting times. The date and time of each quiz will be announced at least a week in advance. There will be no exceptions on quiz times and no makeup quizzes are given. Quizzes are designed to impact your grade positively or not at all. These quizzes will be based on the assigned homework problems for which complete solutions are available in the solutions manual for the required text (on sale at bookstore). At the end of the semester, if your total quiz score is higher than your lowest exam score, then the low exam score will be replaced by the higher quiz score when calculating your final course grade. This means that if you perform well on the quizzes, you can drop a single poor semester exam grade (excluding the final exam).

**III. Problem Sessions:** Problem session times for this section will be used for group-based learning activities (10% of your semester grade), quizzes, and possibly for makeup lectures as necessary. Absences will be noted and are likely to negatively affect your course performance.

**IV. Final Exam:** This exam will be cumulative and will be given at 1:30pm on December 12, 2012 in Collier 204. The college policy on final exams can be found at <http://www.moravian.edu/studentLife/handbook/academic/academic.html>.

**V. Laboratory:** Details are provided in a separate laboratory syllabus.

**VI. Important Dates to Note:**

- Tues. Sept. 4<sup>th</sup> – Last Day for Course Changes
- Fri. Oct. 5<sup>th</sup> – Mid-Term
- Fri. Nov. 2<sup>nd</sup> – Last Day to Withdraw from a Course

## Tentative Lecture Schedule:

<b>Date</b>	<b>Lecture Topic(s)</b>	<b>Text Reference</b>
Mon. 8/27	Introduction, Measurement	1.1, 1.4
Wed. 8/29	Uncertainty in Measurement, Dimensional Analysis	1.5, 1.6
Fri. 8/31	Classification and Properties of Matter, The Atomic Theory of Matter	1.2, 1.3, 2.1
Mon. 9/3	No Class – Labor Day	
Wed. 9/5	Atomic Structure, Atomic Weights, Periodic Table	2.2-2.5
Fri. 9/7	Molecules, Molecular Compounds, Ions, Ionic Compounds	2.6, 2.7
Mon. 9/10	Basic Nomenclature	2.8
Wed. 9/12	Chemical Equations, Reaction Types, Formula Weights	3.1-3.3
Fri. 9/14	Avogadro's Number and The Mole	3.4
Mon. 9/17	Chemical Formulas	3.5
Wed. 9/19	Reaction Stoichiometry, Limiting Reagents	3.6, 3.7
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<b>Fri. 9/21</b>	<b>EXAM 1 – 10:20am</b>	
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Mon. 9/24	General Properties of Aqueous Solutions	4.1
Wed. 9/26	Precipitation Reactions, Acid-Base Reactions	4.2, 4.3
Fri. 9/28	Acid-Base Rxns. (cont.), Oxidation-Reduction Rxns.	4.3, 4.4
Mon. 10/1	Oxidation Numbers, The Activity Series	4.4
Wed. 10/3	Molarity, Dilution Calculations	4.5
Fri. 10/5	Solution Stoichiometry, Titrations	4.6
Mon. 10/8	No Class – Fall Recess	
Wed. 10/10	Exam Review	
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<b>Fri. 10/12</b>	<b>EXAM 2 – 10:20am</b>	
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Mon. 10/15	Introduction to Thermochemistry, Enthalpy, First Law of Thermodynamics, Enthalpies of Reaction	5.1-5.4
Wed. 10/17	Calorimetry, Hess's Law	5.5, 5.6
Fri. 10/19	Enthalpies of Formation	5.7
Mon. 10/22	Wave Nature of Light, Quantization of Energy, Bohr Model of the Atom	6.1-6.3
Wed. 10/24	Wave Behavior of Matter, Quantum Mechanics, Quantum Numbers	6.4-6.6
Fri. 10/26	Multi-Electron Atoms, Electron Configurations, Electron Configurations and The Periodic Table	6.7-6.9

<b>Date</b>	<b>Lecture Topic(s)</b>	<b>Text Reference</b>
Mon. 10/29	Periodic Properties: Effective Nuclear Charge, Atomic and Ionic Radii, Ionization Energy, Electron Affinity	7.1-7.5
Wed. 10/31	Metals, Nonmetals, Metalloids, Periodic Group Trends	7.6-7.8
Fri. 11/2	Chemical Bonds, Octet Rule, Ionic Bonding	8.1, 8.2
Mon. 11/5	Covalent Bonding, Bond Polarity, Electronegativity	8.3, 8.4
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<b>Wed. 11/7</b>	<b>EXAM 3 – 10:20am</b>	
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Fri. 11/9	Lewis Structures, Formal Charge	8.5
Mon. 11/12	Resonance Structures, Octet Rule Exceptions, Bond Enthalpies	8.6-8.8
Wed. 11/14	VSEPR, Molecular Shapes, Molecular Polarity	9.1-9.3
Fri. 11/16	Valence-Bond Theory, Hybrid Orbitals, Multiple Bonds	9.4-9.6
Mon. 11/19	Gases, Gas Laws, Kinetic-Molecular Theory	10.1-10.3, 10.7
Wed. 11/21	No Class – Thanksgiving Recess	
Fri. 11/23	No Class – Thanksgiving Recess	
Mon. 11/26	Ideal-Gas Equation, Applications of Ideal-Gas Equation, Gas Mixtures, Partial Pressures	10.4-10.6
Wed. 11/28	Molecular Effusion and Diffusion, Graham's Law, Deviations from Ideal Behavior	10.8, 10.9
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<b>Fri. 11/30</b>	<b>EXAM 4 – 10:20am</b>	
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Mon. 12/3	Intermolecular Forces, Liquids, Phase Changes	11.1-11.4
Wed. 12/5	Vapor Pressure, Phase Diagrams, Liquid Crystals	11.5-11.7
Fri. 12/7	Classification, Structures and General Overview Of Solids	12.1-12.7
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<b>FINAL EXAM – Wednesday, December 12<sup>th</sup>, 1:30pm</b>		
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### **Tentative Problem Session Schedule:**

<b>Date</b>	<b>Topic(s)</b>
Tues. 8/28	Activity #1
Tues. 9/4	Activity #2
Tues. 9/11	Activity #3
Tues. 9/18	Exam Review
Tues. 9/25	Activity #4
<b>Tues. 10/2</b>	Review and <b>Quiz</b>
Tues. 10/9	No Class – Fall Recess
Tues. 10/16	Activity #5
Tues. 10/23	Activity #6
Tues. 10/30	Activity #7
Tues. 11/6	Exam Review
Tues. 11/13	Activity #8
<b>Tues. 11/20</b>	Review and <b>Quiz</b>
Tues. 11/27	Activity #9
Tues. 12/4	Activity #10