INTRODUCTION: CH1150—University Chemistry I is the first of a two-semester sequence and is designed to give you an overview of the fundamental chemistry topics and problem solving skills required by most science and engineering disciplines. Even if your major does not require the second semester you may be interested in taking it as a science elective during spring 2010 because you already have the book. Students in CH1150 are required to take the associated laboratory (CH1151) as a co-requisite. A separate recitation section (CH1153) is also offered, and you may choose to register for CH1153 even if your major does not require you to do so. The recitation sessions will emphasize problem solving, and will be graded as pass/fail based on attendance and class assignments related to the lecture material.

CLASS SCHEDULE: The lecture meets three times per week on Monday, Wednesday and Friday in Fisher 135 at 10:05 AM and again at 11:05 AM. The lectures only provide you with a guide to the material and you must, therefore, read the relevant textbook chapters prior to the class and again after the class. Unless you have a photographic memory, I also recommend you take notes from the book as you read.

Topic 01: Elements and Compounds
Atomic & molecular structure (Sections 2.1-2.6)
Nomenclature (Sections 2.7, 24.1-24.4)
Lewis structures and molecular geometry (Sections 9.1-9.9, 10.1-10.5)
☞ The molar mass and percent composition material in your topic 01 Redi notes has been integrated into topic 03.
☞ There is an error on the slide “Inorganic Nomenclature 05.” Type III compounds do not contain metals.

Topic 02: Reactions and Equations
Writing and balancing chemical equations (Section 3.7)
Properties of solutions (Section 4.1, 12.1-12.3)
Precipitation reactions and solubility rules (Section 4.2)
Net ionic equations (Section 4.2)
Acids and bases (Section 4.3)
Oxidation-reduction reactions (Section 4.4)

Topic 03: Gravimetric Stoichiometry
Mole and molar mass (Sections 3.1-3.3)
Percent composition, empirical and molecular formulas (Sections 3.4-3.6)
Stoichiometry (Section 3.8)
Limiting reagents (Section 3.9)
Percent yield (Section 3.10)
Gravimetric analysis (Section 4.6)

Topic 04: Volumetric Stoichiometry
Concentration units (Sections 4.5 & 12.3)
Solution preparation and dilution (Sections 4.5 & 12.4)
Acid-base and redox titration (Sections 4.7-4.8)
Topic 05: Thermochemistry I
- System, surroundings, endothermic and exothermic (Section 6.1 & 6.2)
- Introduction to thermodynamics (Section 6.3)
- Enthalpies of reaction (Section 6.4)
- Calorimetry (Section 6.5-6.7)
- Introduction to entropy and free energy (Section 18.1 - 18.3 and 18.5)

Topic 06: States of Matter
- Gas laws (Sections 5.1-5.3)
- Ideal gas equation (Section 5.4)
- Gas stoichiometry (Section 5.5)
- Daltons law (Section 5.6)
- Kinetic molecular theory, Grahams law, Real gases (Section 5.7)
- Intermolecular forces (Sections 11.1 & 11.2)
- Properties of liquids (Section 11.3)
- Crystal structure and types (Sections 11.4-11.7)
- Phase changes and phase diagrams (Sections 11.8 & 11.9)

Topic 07: Properties of Solutions
- Types of solutions and solution process (Sections 12.1 & 12.2)
- Effect of temperature and pressure on solubility (Sections 12.4 and 12.5)
- Colligative properties (Sections 12.6 and 12.7)

Topic 08: Chemical Kinetics I
- Rates of reaction (Section 13.1)
- Rate Law (Section 13.2)
- First order integrated rate law (Section 13.3)
- Temperature dependence (Section 13.4)

Topic 09: Chemical Equilibrium I
- Equilibrium concept (Section 14.1)
- Equilibrium constant (Section 14.2 & 14.3)
- Equilibrium concentrations (Section 14.4)

REDINOTES: The class PowerPoint slides for this semester have been packaged with your textbook and are known as Redinotes. These notes are NOT designed to replace taking good notes, but they will reduce your need to copy everything from the slides and will allow you to pay closer attention to classroom discussion, write down any additional information, and participate via the iClicker system.

BLACKBOARD: Michigan Tech uses the course management software known as Blackboard to provide you with secure access to grades, class material, homework and so on. Although we are using ARIS for your online homework and quizzes, I have placed other useful material on the Blackboard site. To access Blackboard you go to http://courses.mtu.edu and enter your Michigan Tech ISO username and password. Once logged in, you will be presented with a list of the courses you are currently registered in. Select the one that is labeled “Combined Sections (pcharles) - CH1150 - Fall 2009” for access to class related materials.

ONLINE HOMEWORK: You received a code card with the purchase of your textbook that will give you access to the ARIS homework system. Do not lose it! When registering on ARIS you MUST use your Michigan Tech email address to receive credit for the work you do. The ARIS online homework has 15 tutorial problem sets that will become available throughout the semester. Each tutorial problem set
consists of a series of questions, many of which include help should you have difficulties. In addition to the tutorial problems, there are a number of challenging assignments that do not include help. These will become available shortly before each examination. I will provide you with further details and the class codes during the first, or second, class periods.

You can register for access to the online homework as follows:

1. Go to www.mharis.com and click students within the first week of class.
2. Under Join a Course, Enter the section enrollment number (FFD-F8-B7C) using CAPITAL letters.
3. Click Next>>
4. Enter the 20-digit alphanumeric registration code from the card that came with your textbook.
5. Enter your Michigan Tech email address and click Submit. If you enter any other address risk not receiving any credit for your online homework because the ARIS software will not be able to communicate with the Michigan Tech Blackboard system and you could potentially lose 300 points.
6. Create your account by entering your Michigan Tech email address and creating a password (WRITE IT DOWN) that you will use to access your online homework on future visits.
7. Select “Michigan Technological Univ (Houghton)” for your school, create a security question in case you forget your password, and accept the terms of service agreement. Then click the Complete My Registration button.
8. Once registered, you will see a page that shows announcements and assignments. At the start of the class, you should just see one available assignment. You will also receive two email messages from noreply-he@mcgraw-hill.com confirming your registration. They become caught in your spam filter (mine did), so find and save them somewhere safe.

i>CLICKER: Studies have shown that it is extremely important for students to be engaged in the classroom experience if they are to maximize their learning. One way of doing this is to ask questions, have discussions, and perform in-class quizzes. In an attempt to get you all thinking about the material and considering the problems, we will use i>clicker remotes (available at the bookstore). The i>clicker is a response system that allows you to respond to questions I pose during class, and you will be graded on that feedback and your in-class participation. This is the first time I have used i>clicker remotes and my goal is for them to provide you with feedback on your learning rather than them simply acting as a measure of your attendance. In an attempt to achieve this, I will drop around 15% of the lowest scores so that you can “have bad days” on some percentage of your classes without penalty.

In order to receive this credit, you will need to register your i>clicker remote online within the first week of class as follows:

1. Before registering, you must come to class and vote on at least one question in order to complete this registration properly. This should, hopefully, have happened on the first day.
2. Once you have voted on a question in my class, go to http://www.iclicker.com/registration.
3. Complete the fields with your first name, last name, student ID, and remote ID.
   a. Your student ID must be your Michigan Tech ISO Login (e.g. pcharles) otherwise the i>clicker software will not communicate with Blackboard and you will not get credit.
   b. Your remote ID is the series of numbers and sometimes letters found on the bottom of the back of your i>clicker remote.
   c. i>clicker will be used every day in class, and you are responsible for bringing your remote daily.

SUGGESTED TEXTBOOK PROBLEMS: Even though I have assigned online homework I would still encourage you to work through as many of the even-numbered end of chapter problems that you can. These problems have answers in the back of the book and will greatly help you prepare for examinations.
There are many ways of approaching chemistry, so by working on as many practice problems as you can, you are maximizing your chances of recognizing and completing the problems you face under exam conditions. The following are some suggested end-of-chapter problems to get you started:

**Topic 01**  Chapter 02: 14, 16, 32, 34, 44, 46, 50, 58, 60  
Chapter 24: 16, 26, 27, 28, 34, 36, 42, 60

**Topic 02**  Chapter 03: 59, 60  
Chapter 04: 10, 20, 32, 34, 46, 50, 54, 56

**Topic 03**  Chapter 03: 24, 26, 44, 46, 48, 50, 52, 54, 66, 68, 72, 76, 84, 86, 90, 94  
Chapter 04: 78, 80

**Topic 04**  Chapter 04: 60, 62, 64, 70, 72, 74, 86, 88, 92, 94  
Chapter 12: 13, 14, 16, 18, 22, 24

**Topic 05**  Chapter 06: 1, 7, 11, 12, 14, 16, 21, 23, 26, 28, 32, 34, 36, 38, 46, 54, 58, 76, 82  
Chapter 18: 1, 4, 5, 6, 9, 10, 16, 19, 20

**Topic 06**  Chapter 05: 18, 20, 22, 32, 34, 40, 42, 44, 48, 52, 54, 56, 64, 68, 78, 84, 90  
Chapter 11: 10, 12, 14, 16, 18, 20, 21, 22, 24, 27, 32, 33, 38, 44, 49, 52, 54, 56, 59, 62, 67, 68, 78, 84, 86, 88, 91, 94

**Topic 07**  Chapter 12: 3, 8, 10, 25, 28, 32, 38, 39, 41, 43, 50, 52, 54, 58, 62, 64, 66, 68, 72, 74, 78

**Topic 08**  Chapter 13: 2, 3, 6, 8, 10, 14, 15, 16, 18, 24, 25, 26, 31, 33, 35, 37, 38, 40

**Topic 09**  Chapter 14: 1, 2, 5, 7, 8, 14, 16, 18, 20, 26, 28, 30, 32, 37, 38, 40, 42, 44, 46, 48

**PRACTICE EXAMS AND PROBLEMS:** As part of your textbook pack I have provided you with a large selection of practice exams and problems from previous classes that I have taught. These are all real questions that students have experienced at some time in the past. The sample exams call for hand-written responses to the questions and will give you a good opportunity to test your mastery of the material. Keep in mind that the format for your actual exams will be multiple choice. The advantage with multiple-choice is, at least you know the answer is there somewhere! ☺

**EXAMINATIONS:** There will be three multiple-choice "hour" exams worth 100 points each, and one multiple-choice final exam worth 200 points. The "hour" examinations will take place at 6.00pm on September 30th, October 28th, and December 2nd. A Friday class will be cancelled in lieu of each evening exam. Final exam dates are located at http://www.admin.mtu.edu/em/students/plan/finalexam.php

**EXAM and other ACCOMMODATIONS:** If you require accommodations, a quiet place to take exams, recorded textbooks etc., please see the Coordinator of Student Disability Services in the Dean of Students Office, Room 170 Administration, 487-2212.

**GRADING:** Your grade will be based upon the percentage of the total points available that you accumulate and are divided between assignments as shown below. The pass mark for this class is provisionally set at 60%, a grade C is set at 70%, a Grade B is set at 80%, a Grade A is set at 90%.

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Weight</th>
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<tbody>
<tr>
<td>Online Homework</td>
<td>30%</td>
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<tr>
<td>iClicker</td>
<td>20%</td>
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<tr>
<td>Hour Exams</td>
<td>30%</td>
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<tr>
<td>Final Exam</td>
<td>20%</td>
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<td>100%</td>
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CHEMISTRY LEARNING CENTER (CLC): The CLC is a free service provided by the Department of Chemistry and the University to provide support for students enrolled in first year chemistry lecture courses. The CLC is located in room 208 of the chemical sciences building and staffed by upper level undergraduates (coaches), who have a good background in chemistry and are familiar with the courses. Services offered include weekly appointments, walk-in assistance, reference library, computer-assisted learning and a comfortable place to study chemistry. Stop by for more information.

CH0100: Students who would like to have a weekly individual or team learning group should stop by the CLC during the first week of class to sign up for a time. Plan to attend your first weekly appointment, which begins the second week of classes. Students with regular appointments should be enrolled in CH0100. If you are not enrolled when you sign up for a time, you will be automatically enrolled. There is no cost for CH0100. Plan to attend every appointment. However, you are allowed to miss one appointment if an emergency comes up and still receive a satisfactory grade. Walk-in hours are also available in-between appointments or team meetings.

Chemistry Learning Center Walk-In Hours

<table>
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<tr>
<th>Day</th>
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<tbody>
<tr>
<td>Sunday</td>
<td>7:00 - 9:00 pm</td>
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<tr>
<td>Monday</td>
<td>10:00 - 4:00 pm</td>
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<td>Tuesday</td>
<td>10:00 - 4:00 pm</td>
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<tr>
<td>Wednesday</td>
<td>10:00 - 4:00 pm</td>
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<tr>
<td>Thursday</td>
<td>10:00 - 4:00 pm</td>
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SUPPLEMENTAL INSTRUCTION (OPTIONAL): The SI sessions are optional but highly recommended. A significant number of hours each week are required to learn the material so that you are prepared for next semester. You won’t be able to learn everything in your short CLC session each week. Since you will need to spend this time studying anyway, students have found it effective to attend 1, 2 or 3 SI sessions each week. Students attending on a regular basis usually earn a full grade higher than those who do not attend. The SI leaders will announce the study session times and locations.

ABSENCE POLICY: For exams, an unexcused absence is an automatic zero for any exam that is missed. The Office of Student Affairs, or your instructor may grant an excused absence. If you know that you will have an official university excused absence on a day that an exam is scheduled (university athletic event, religious holiday, or funeral), you are required to make arrangements as early as possible in advance of the exam date. Failure to provide at least one weeks notice may result in a grade penalty. I do not write make up exams, so you will generally be expected to take the exam immediately before leaving. Where this is not feasible we use the score from your next exam. Excused absences will not be given to travel home, or attend “social” events such as weddings. Therefore, you should plan to take your exam at the scheduled time. If you believe you are too sick to take an exam, you must contact the instructor, or Ms Blau BEFORE the exam and then have a doctors note stating your illness prevents (or prevented) you from taking the exam, not simply that you visited the doctors office.

ACADEMIC INTEGRITY: Both students and faculty are responsible for insuring the academic integrity of the University according to the procedures in "Academic Integrity at Michigan Tech - A Guide for Students and Faculty." Specific violations in this course would be the intentional use of any unauthorized study aids, equipment, or another's work during an examination (cheating) or allowing/helping another individual to cheat (facilitating academic dishonesty). Possible sanctions include an academic integrity warning, an "F***" grade indicating failure due to academic dishonesty, suspension or expulsion.
IMPORTANT NOTICE ABOUT STUDYING: For many of you this will be your first true taste of freedom and it is extremely easy to become intoxicated by the knowledge that you can do pretty much what you want. I whole heartedly encourage you to explore what Michigan Tech has to offer, particularly when the snow flies, but do this AFTER you have completed a couple of hours studying each night and you will be much happier in your classes. Remember that you are entirely responsible for your grade in this class, so if you choose not to study the recommended minimum of 9 hours per week you may find your grades are not quite what you expected.

Michigan Tech complies with all federal and state laws and regulations regarding discrimination, including the Americans with Disabilities Act of 1990 (ADA). If you have a disability and need a reasonable accommodation for equal access to education or services at Michigan Tech, please call Christy Oslund, Student Disability Services (cmoslund@mtu.edu), or Dr. Gloria Melton, Dean of Students (7-2212).