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 because you already have the book.

CLASS SCHEDULE: 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.

Unit 01: Atomic Structure and Periodicity
- U01M01: Atomic Structure 01 (Section 2.1-2.3)
- U01M02: Atomic Structure 02 (Sections 2.1-2.3)
- U01M03: The Mole & Molar Mass (Sections 3.1-3.5)
- U01M04: Quantum Mechanical Model (Sections 7.1-7.5)
- U01M05: Quantum Numbers (Sections 7.6-7.9)
- U01M06: Electron Configurations (Sections 8.1-8.6)
- U01M07: Periodic Properties (Sections 8.1-8.6)

Unit 02: Ionic and Covalent Compounds
- U02M01: Molecular and Ionic Formulas (Sections 2.5 & 2.6, 9.2)
- U02M02: Percent Composition (Sections 3.4-3.6)
- U02M03: Empirical Formulas (Sections 3.4-3.6)
- U02M04: Molecular Formulas (Sections 3.4-3.6)
- U02M05: Inorganic Nomenclature 01 (Section 2.6 & 2.7)
- U02M06: Inorganic Nomenclature 02 (Section 2.6 & 2.7)
- U02M07: Organic Nomenclature 01 - Introduction To Organic Compounds (Section 2.8)
- U02M08: Organic Nomenclature 02 - Alkanes (Sections 2.8, 24.1 to 24.4)
- U02M09: Organic Nomenclature 03 - Alkenes and Alkynes (Sections 2.8, 24.1 to 24.4)
- U02M10: Organic Nomenclature 04 - Alcohols (Sections 2.8, 24.1 to 24.4)
- U02M11: Organic Nomenclature 05 - Aldehydes and Ketones (Sections 2.8, 24.1 to 24.4)
- U02M12: Organic Nomenclature 06 - Carboxylic Acids (Sections 2.8, 24.1 to 24.4)
- U02M13: Writing Lewis Symbols (Sections 9.1-9.9)
- U02M14: Formal Charge and Resonance (Sections 9.1-9.9)
- U02M15: Bond Polarity (Sections 9.1-9.9)
- U02M16: Molecular Geometry (Sections 10.1-10.5)
- U02M17: Molecular Polarity (Sections 10.1-10.5)
Unit 03: Reactions and Equations
U03M01: Writing Chemical Equations (Section 3.7)
U03M02: Balancing Chemical Equations 01 (Section 3.7)
U03M03: Balancing Chemical Equations 02 (http://goo.gl/kj4cT or http://goo.gl/x9m1L)
U03M04: Precipitation and Solubility Rules (Section 4.2)
U03M05: Net-Ionic Equations (Section 4.2)
U03M06: Acids and Bases (Section 4.3)
U03M07: Oxidation-Reduction Reactions (Section 4.4)
U03M08: Redox Balancing in Acid-Base Solutions (Section 4.4, 18.1)
U03M09: Complexation Reactions (Section 23.1 to 23.3)

Unit 04: Stoichiometry
U04M01: Introduction to Stoichiometry (Section 3.8)
U04M02: Limiting Reagents (Section 3.9)
U04M03: Percent Yield and Gravimetric Analysis (Section 3.10)
U04M04: Gravimetric Analysis Methods (Section 4.6)
U04M05: Concentration Units and Molarity (Sections 4.5 & 12.3)
U04M06: Molality and Normality (Sections 4.5 & 12.3)
U04M07: Mass and Volume Percent (Sections 4.5 & 12.3)
U04M08: Concentration Unit Conversion (Sections 4.5 & 12.3)
U04M09: Solution Preparation and Dilution (Sections 4.5 & 12.4)
U04M10: Solution Stoichiometry (Sections 4.7-4.8)

Unit 05: Introduction to Thermodynamics
U05M01: Basic Terminology (Section 6.1 - 6.3)
U05M02: Energy and Work (Section 6.1 - 6.3)
U05M03: Enthalpy of Reactions (Section 6.4)
U05M04: Calorimetry (Section 6.5-6.7)
U05M05: Introduction to Entropy (Section 18.1 - 18.3 and 18.5)
U05M06: Introduction to Free Energy (Section 18.1 - 18.3 and 18.5)

Unit 06: States of Matter
U06M01: Fundamental Gas Laws (Sections 5.1-5.3)
U06M02: Ideal Gas Equation (Section 5.4 & 5.5)
U06M03: Dalton’s Law for Mixtures of Gases (Section 5.6)
U06M04: Kinetic Molecular Theory (Section 5.7)
U06M05: Intermolecular Forces and Liquid Properties (Sections 11.1 to 11.3)
U06M06: Properties of Solids (Sections 11.4-11.7)
U06M07: Phase Changes and Clausius Clayperon Equation (Sections 11.8)
U06M08: Phase Changes and Thermodynamics (Sections 11.8)
U06M09: Phase Diagrams (Sections 11.9)

Unit 07: Properties of Solutions
U07M01: Solutions and the Solution Process (Sections 12.1 & 12.2)
U07M02: Factors Affecting Solubility (Sections 12.4 and 12.5)
U07M03: Van’t Hoff and Vapor Pressure Lowering (Sections 12.6 and 12.7)
U07M04: Boiling Point Elevation and Freezing Point Depression (Sections 12.6 and 12.7)
U07M05: Osmosis and Osmotic Pressure (Sections 12.6 and 12.7)
U07M06: Molar Mass Determination (Sections 12.6 and 12.7)
Unit 08: Introduction to Chemical Kinetics
U08M01: Rates of Reaction (Section 13.1)
U08M02: Rate Law (Section 13.2)
U08M03: First Order Integrated Rate Equation (Section 13.3)
U08M04: Temperature Dependence (Section 13.4)

Unit 09: Introduction to Chemical Equilibrium
U09M01: Equilibrium Concept (Section 14.1)
U09M02: Equilibrium Constant Calculations (Section 14.2 & 14.3)
U09M03: Equilibrium Concentrations (Section 14.4)

REDINOTES: The class PowerPoint slides for this semester have been placed on Canvas 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, and write down any additional information.

CANVAS: Michigan Tech uses the course management software known as Canvas to provide you with secure access to grades, class material, homework and so on. Canvas will be used to administer online homework and quizzes throughout the class as well as provide access to the recorded versions of the lecture materials; I have placed other useful material on the Canvas site. To access Canvas you go to http://mtu.instructure.com 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.

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, from 10th edition, to get you started:

Unit 01
Chapter 02: 05, 06, 14, 16
Chapter 03: 16, 20, 24, 26, 28, 30
Chapter 07: 08, 10, 12, 16, 18, 20, 26, 30, 32, 34, 40, 42, 56, 58, 60, 66, 70, 76, 78, 90
Chapter 08: 20, 22, 24, 28, 32, 38, 44, 46, 52, 56, 62

Unit 02
Chapter 02: 32, 33, 34, 36, 44, 46, 50, 58, 60
Chapter 03: 40, 42, 44, 46, 48, 50, 52, 54
Chapter 07: 20, 32, 50, 54, 56, 58
Chapter 09: 16, 18, 36, 38, 40, 44, 46, 48, 52, 54, 56, 62, 64
Chapter 10: 08, 10, 12, 14, 20, 22, 24, 32, 36, 40
Chapter 24: 16, 26, 27, 28, 34, 36, 42, 60

Unit 03
Chapter 03: 59, 60, 63, 64
Chapter 04: 08, 10, 12, 14, 18, 20, 22, 24, 32, 34, 44, 46, 48, 50, 54, 56

Unit 04
Chapter 03: 66, 68, 70, 72, 74, 76, 82, 84, 86, 90, 92, 94, 108
Chapter 04: 60, 62, 64, 70, 72, 74, 78, 80, 86, 88, 92, 94
Chapter 12: 13, 14, 16, 18, 22, 24, 102, 108

Unit 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
GRADING: All assignments are online and are detailed on the Canvas site. 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%.

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.

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: On-campus 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

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<tr>
<th>Day</th>
<th>10:00 - 4:00 pm</th>
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<td>Thursday</td>
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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).