Studio Laboratory II (CH1122)
Spring Semester 2016

Lecture/Lab: Paul Charlesworth
Recitation: Laleh Vahdat
CLC: Lois Blau
Laboratory: Tues/Thur 14:05-16:55pm in ChemSci 708
Office Hours: By appointment.

Introduction: The Studio Laboratory provides an overview of the chemical concepts and laboratory techniques that the chemistry department believes are important to your chemistry careers and place a strong emphasis on developing your laboratory skills. Studio Laboratory II is the second part of this two-semester sequence and focuses on topics such as kinetics, equilibrium, thermodynamics, electrochemistry, and organic chemistry. The material presented in class is only sufficient to provide you with a guide on which you base your private study. If you take very good notes in class, learn that material well, and apply it to the laboratory experience, you will (probably) be fine. However, if you want a good grade then you must spend a few more hours writing and expanding your notes using your textbook and the library resources, and working problems. It is up to you to make sure that you understand the theory behind problems you are solving and the experiments you performed. A typical week will be laid out as follows:

Tuesday: 14:05 - 16:55 Laboratory Session (First 30-60 mins will be theory)
Thursday: 14:05 - 16:55 Laboratory Session (First 30-60 mins will be theory).
13:05 - 13:55 Recitation Session

Recitations: Will be structured to provide you with opportunities to ask questions and improve your understanding of material from your previous weeks experiments. Your recitation instructor will describe the recitation format during the first session.

Handouts: Several handouts will be distributed during the course to complement the text. The class PowerPoint slides will be printed at a rate of four slides per page and provided as a digital or print format. It is hoped that we will have them ready during the week before the class you need them for, but this may not always be possible. It is assumed that you all have a computer or printer. These notes are NOT designed to replace taking good notes, but they will reduce your need to copy everything from the slides and so allow you to pay more attention to classroom discussion. The lecture component of each studio lab session will be paced based on the assumption that you are using the RediNotes and the online materials.

Homework: We will have weekly homework worth a total of 100 points. It is intended that the assignments will be online or distributed during class, and due one week later.

Laboratory Reports: Typed laboratory reports are typically collected one week after the experiment, giving about 7 days, but your Laboratory Teaching Assistant will set the specific schedule based on the experiments. If you require an extension, for any reason, you must request that extension from your teaching assistant when the assignment is distributed, not when it is due. Late assignments will be penalized 10% of the assignment value per day. Therefore, a 15-point assignment that is 5 working days late would be worth a maximum of 7.5 points.
Examinations: The examination schedule consists of three 100pt "hour" examinations. These will be hand-graded and cover material up to the Thursday recitation period before the exam date. In addition to the three "hour" examinations, there will be an ACS Standardized Chemistry Examination during the week-14 recitation session, and one comprehensive final examination held finals week.

1. Hour exam dates:
   - Exam 1: Wednesday, Feb 17th, 6:00 - 7:00 pm
   - Exam 2: Wednesday, Mar 26th, 6:00 - 7:00 pm
   - Exam 3: Thursday Apr 24th during final class.

2. University regulations require that one hour of class is canceled per hour of evening exam therefore I will cancel one laboratory session on the Thursday before Spring Break.

Grading: Your grade will be based on the percentage of total accumulated points from the following assignments. The pass mark for this class is currently set at 60%, a grade C is set at 68%, a Grade B is set at 78%, and a Grade A is set at 88%. The actual "curve" will be determined after the final exam.

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<tr>
<th>Assignment</th>
<th>Points</th>
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<tr>
<td>Laboratory</td>
<td>100</td>
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<tr>
<td>Homework/Quizzes</td>
<td>100</td>
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<tr>
<td>Recitation</td>
<td>100</td>
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<tr>
<td>Exams</td>
<td>500</td>
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<td>Total</td>
<td>800</td>
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Absence Policy: Attendance in class is mandatory. If you miss more than two unexcused class sessions, you risk an automatic fail in this class. If you are repeatedly late to class, you risk an automatic half-grade reduction. 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 or religious holiday), you are required to make arrangements as early as possible in advance of the exam date. Failure to provide at least one weeks notice will result in your misery. Excused absences will not be given to travel home or to attend a social event. Plan to take your exam at the scheduled time. If you believe you are too sick to take an exam, you must have a doctors note stating your illness prevents (or prevented) you from taking the exam, not simply that you visited the doctors office.

FINANCIAL AID SATISFACTORY ACADEMIC PROGRESS POLICY: Federal financial aid regulations now require students make satisfactory academic progress towards their degree to remain eligible for financial aid, which means we must report whether you failed a class "with effort" or "without effort." For the purpose of this class, I have decided that anyone who does not complete ALL examinations, or attend at least 75% of classes will be considered to have failed "without effort."

ACADEMIC INTEGRITY: Both students and faculty are responsible for ensuring 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 could 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). This includes on campus and online assignments. Possible sanctions if found responsible for academic dishonesty include an warning, probation, suspension or expulsion. In addition to those sanctions, students found responsible for academic dishonesty, will receive a failing grade in this class.
**LEARNING ACCOMMODATIONS:** If you require accommodations, a quiet place to take exams, recorded textbooks etc., please contact the Coordinator of Student Disability Services in the Dean of Students Office, Room 170 Administration, 487-2212. *If we do not know about you, we cannot help you. So, please do not wait until you are failing your classes to ask for help.*

**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*

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<tr>
<th>Day</th>
<th>10:00 - 5:00 pm</th>
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<tr>
<td>Sunday</td>
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<td>Monday</td>
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<td>Thursday</td>
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**CLASS SCHEDULE:** Is designed to provide you with a guide to the class material so that you may read the relevant chapters prior to the class and again after the class. The topics and dates are approximate and do not represent an exact schedule, and are subject to some changes.

**Topic 01: Properties of Solutions**
- Vapor Pressure (11.2)
- Mixtures of Volatile substances (11.3)
- Colligative Properties (11.4)
- Osmosis and Osmotic Pressure (11.5)
- Molar Mass Determination (11.6)

**Topic 02: Thermodynamics**
- Spontaneous processes (12.1)
- Entropy (12.2)
- Entropy and Molecular Structure (12.3)
- Applications of the Second Law (12.4)
- Calculating Entropy Changes (12.5)
- Free Energy (12.6)
- Temperature and Spontaneity (12.7)
Topic 03: Chemical Kinetics
- Reaction Rates (13.2)
- Concentration Dependence (13.3)
- Temperature Dependence (13.4)
- Reaction Mechanisms (13.5)

Topic 04: Chemical Equilibrium
- Equilibrium Condition (14.1)
- Equilibrium Constants (14.2 - 14.4, 14.6)
- Factors Affecting Equilibrium (14.7)
- Equilibrium Calculations using K (14.8)
- Equilibrium and Thermodynamics (14.9 & 14.10)

Topic 05: Aqueous Equilibria
- Acid-Base Concept (15.1 & 16.1)
- Acid Strength (15.2)
- Calculations involving $K_a$, $K_b$ and pH (15.3-15.4)
- Polyprotic Acids (15.5)
- Acid-Base Properties of Salts (15.6)
- Common Ion Effect (15.7)
- Buffers (15.8)
- Indicators and Titrations (15.9)
- Solubility Equilibria (15.10)

Topic 08: Coordination Complexes
- Complex Ions (16.2)
- Nomenclature (16.3 & 16.4)
- Ligand Strength and Chelate Effect (16.5)
- Crystal Field Theory (16.6 & 16.7)
- Isomerism (16.8)

Topic 09: Organic Chemistry
- Alkanes (19.2)
- Alkenes and Alkynes (19.3)
- Aromatic Hydrocarbons (19.4)
- Amines (19.5)
- Alcohols and Ethers (19.6)
- Carbonyl Compounds (19.7)
- Isomers (19.8)
- Organic Reactions (Handouts)
- Polymers (22.5 & 22.6)

Topic 10: Electrochemistry
- Electrochemical Cells (17.2)
- Standard Potentials (17.3 - 17.5)
- Concentration Cells (17.6 & 17.7)
- Electrolytic Cells (17.8)
- Fuel Cells (17.9)

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, please call Christy Oslund, Student Disability Services (cmoslund@mtu.edu), 7-2212.