CHEMISTRY 141 SYLLABUS
Fall 2014
Sections 71-84
11:20 – 12:40 T TH 138 Chemistry

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Office Hours: By appointment/TBA

This lecture section of CEM 141 is part of a new chemistry curriculum *Chemistry, Life, the Universe and Everything (CLUE)*, a project funded by the National Science Foundation (NSF #0816692). The curriculum is based on research on learning and designed to help you to learn the fundamental concepts of chemistry. While the approach may be somewhat different from what you are used to, we believe (and have evidence) that you will finish this course with a deeper understanding of chemistry principles, and that you will be able to use this knowledge in subsequent courses. (That is: you will learn what you need to know for further study in chemistry and other subjects – for example biological and health sciences)

**Required Materials:**

**Text:** An electronic draft version of *Chemistry, Life, the Universe and Everything (CLUE)* by Melanie M. Cooper and Michael W. Klymkowsky will be provided to you at no cost. In addition, you will be given links to on-line textbooks and resources that will be useful. If you have a general chemistry text from a previous semester it will be a useful resource but is not necessary to purchase a new text.

**iClicker Remote:** A remote iClicker is required for this class. You can use either an iClicker + or an iClicker-2, available from the book store, on online.

**Websites:** We will use the D2L course website to post class materials (d2l.msu.edu). Assistance with D2L is available 24/7 through MSU Distance Learning Services (aka. the Help Desk) at (517) 355-2345 or (800) 500-1554. In addition, homework will be posted on our online system, beSocratic, details to follow

**Recitation:** Each of you is enrolled in recitation section. Attendance at recitation is required. Each week you will receive an assignment that will be completed in recitation. You will also have an opportunity to ask and answer questions, and review the previous weeks material.

**Course Outline:** *Chemistry, Life, the Universe and Everything.*
A separate detailed outline of the course material, and expected outcomes will be provided: we will be studying Chapters 1-5

Chapter 1 Atoms
Chapter 2 Electrons and orbitals
Chapter 3 Elements, bonding and physical properties
Learning Outcomes: CLUE CH 101

Students in this course will learn to:

- Explain and model how the existence of atoms leads to the conservation of matter.
- Use appropriate models and theories to describe chemical and physical phenomena.
- Construct representations of chemical species and use them to predict chemical and physical properties.
- Explain how and why the atomic-molecular structure affects the properties of a substance, and vice versa.
- Predict and explain the energy changes associated with interactions of atoms, molecules, and ions.
- How to apply systems thinking to both molecular level and macroscopic systems.

Assessment:

The assessment in this class will consist of:

- In-class clicker questions 5%
- In class activities and homework (group or individual) 15%
- Tests (3) (15%, 15% and 15%) 45%
- Final Exam 20%
- Recitation points 15%

Notes:

1. Class attendance will be monitored by your responses to clicker questions. You will automatically receive credit for attendance in each class if you answer more than 70% of the questions asked on that day. If you miss more than three classes, each class you miss will count as one lost point from your clicker total (max 5 points).

2. Each class will involve group and/or individual activities. These will be graded and will count towards your grade. In addition, homework activities will be given on beSocratic, or to hand in during the next class, or in recitation.

3. Three tests will be given on the dates and times specified. There will be no make-up tests, however, if you miss a test with an excused absence, the final will count for that test grade. Note that the tests are given in the evening. You will be notified about the location nearer the test time.

4. The final exam will be cumulative – it will cover all the material in the course. If it is to your advantage, and you make over 65% on the final, the final exam will substitute for your lowest exam grade. Students are reminded of the following University policy outlined in Academic Programs:

   “A student absent from a final examination without a satisfactory explanation will receive a grade of 0.0 on the numerical system, NC on the CR-NC system, or N in the case of a course authorized for grading on the P-N system. Students unable to take a final examination because of illness or other reason over which they have no control should notify the associate deans of their colleges immediately.”

Test days

Test 1: Wednesday, October 1
Test 2:   **Wednesday, October 29**  
Test 3:   **Wednesday, December 3**  
Final Exam: **Tuesday, December 9 – 7:45-9:45 a.m**

**Grading Scale:** Final grades will be assigned on the following average score range:
- 90% and above 4.0  
- 85% through 89% 3.5  
- 80% through 84% 3.0  
- 75% through 79% 2.5  
- 70% though 74% 2.0  
- 69% through 65% 1.5  
- 60% though 64% 1.0  
- below 60% 0

**Class Philosophy:**

In a traditional classroom the flow of information is typically from the instructor to students. While this is a very efficient way to deliver simple information and learn skills (such as numerical problem solving and material to be memorized), it is not a very effective way to learn complex subjects, like chemistry. In order to learn something (well) it is important to think about the concepts you are learning, understand their implications, and when faced with a new problem, be able to be explicitly aware about your assumptions and clarify (for yourself and others) your understanding.

The approach we will take in this class is to ask you lots of questions, and based on your answers we will provide feedback, more questions – and some answers! While it may seem easier to just tell you what we want you to know, and how to solve problems, we have found that this approach is not very effective at promoting learning. The goal of this class is to help you become a **self directed learner**, and to teach you skills that will stand you in good stead for the rest of your life. Learning how to learn (and how to think) is difficult, and it is understandable if you come to feel a bit bewildered initially. But bear with us – you will learn more, in more depth, than you would in a traditional lecture format.

If you do all the assigned work and keep up with the material you will find this course to be interesting and rewarding. If not, you will find that the course quickly becomes incomprehensible. You must keep up, it is impossible to recover once you fall behind. The work in this course is university level: it is not enough to recall facts and definitions and solve simple problems. The goal of this course is for you to understand chemical processes on the molecular level - to do this you will need to understand chemical concepts and be able to solve complex problems involving a number of steps.

**A word about me and the graduate student teaching assistants**

Our role in this course will be to help you understand the concepts and materials in the course. There will be many different methods to accomplish this, many of which will require you to become active participants in the classroom. A typical class period will consist of short lectures, clicker questions, and group activities. We welcome questions, and will do our utmost to help you, but in the long run what **you get from this course depends on you.**
Academic Integrity Policy
Academic integrity is enormously important, however some activities in this class can (and should) be done in groups. I will do my best to make sure you understand when it is OK to discuss work with others and when you should not. It goes without saying that all exams are your own work. In addition your iClicker points are individual.

Accommodations for Students with Disabilities
Michigan State University is committed to providing equal opportunity for participation in all programs, services and activities. Requests for accommodations by persons with disabilities may be made by contacting the Resource Center for Persons with Disabilities at 517-884-RCPD or on the web at rcpd.msu.edu. Once your eligibility for an accommodation has been determined, you will be issued a verified individual services accommodation (“VISA”) form. Please present this form to me at the start of the term and/or two weeks prior to the accommodation date (test, project, etc). Requests received after this date will be honored whenever possible.

Prerequisites:
Before beginning this class, you should be able to do the following (some of these will be reviewed briefly, but if you cannot do these, you should work especially hard now, or consider delaying chemistry until you build your background). This background knowledge is expected on all exams!

- Use mathematical terms and equations including: algebra, exponential numbers, logarithms, ratio and proportion.
- Use significant figures appropriately
- Do calculations that require unit conversions
- Use SI units and their appropriate prefix (eg nano, mega etc)
- Make and interpret graphs.
- Interpret word problems

General Chemistry Support: General chemistry is a vast empire! Many students are enrolled in many different courses. If you have questions about general chemistry courses or laboratories please consult these resources and people.

General Chemistry Office General information and assistance is available at the General Chemistry Office, Room 185 Chemistry (M-F 8-12 noon and 1-5 pm; tel 5-9715 ext 323).
General Chemistry Coordinator: Wendy Whitford email: tsuji@chemistry.msu.edu
Undergraduate Program Manager: Steve Poulios email: poulios@msu.edu
CEM 141 web site: http://www.chemistry.msu.edu (more info later)
Cemscores web site From any computer on campus, enter cemscores as the url. From computers off-campus, you can access the site through the CEM 141 web site.

Laboratories: Labs will begin the week of September 1. Concurrent lab enrollment is not required. If you are enrolled in lab you will receive information separately