CHEMISTRY 142 – Spring 2020

SYLLABUS

CEM 142 is the second part of a chemistry curriculum called *Chemistry, Life, the Universe and Everything (CLUE)*. The curriculum is 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 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.

The Two Parts of this Course

Lecture

There are three lecture sections of CEM 142 this semester that meet in room 138 Chemistry. **Attendance at the lecture section for which you are enrolled is required!** Lectures will begin on Tuesday, January 7th and meet every Tuesday and Thursday that the University is open.

<table>
<thead>
<tr>
<th>Section Numbers</th>
<th>Days</th>
<th>Time</th>
<th>Instructor</th>
</tr>
</thead>
<tbody>
<tr>
<td>001 – 012</td>
<td>TuTh</td>
<td>12:40 – 2:00pm</td>
<td>Dr. Virginia Cangelosi</td>
</tr>
<tr>
<td>013 – 024</td>
<td>TuTh</td>
<td>2:40 – 4:00pm</td>
<td>Dr. Virginia Cangelosi</td>
</tr>
<tr>
<td>025 – 036</td>
<td>TuTh</td>
<td>4:20 – 5:40pm</td>
<td>Dr. Amy Pollock</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Instructor</th>
<th>Email</th>
<th>Office</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr. Virginia Cangelosi (she/her/hers)</td>
<td><a href="mailto:cangelosi@chemistry.msu.edu">cangelosi@chemistry.msu.edu</a></td>
<td>141 Chemistry</td>
<td>(517) 353-0500</td>
</tr>
<tr>
<td>Dr. Amy Pollock (she/her/hers)</td>
<td><a href="mailto:pollock@chemistry.msu.edu">pollock@chemistry.msu.edu</a></td>
<td>181 Chemistry</td>
<td>(517) 353-1133</td>
</tr>
</tbody>
</table>

Recitation

Recitation is a 50-minute class that meets one time a week. Recitations will begin on Monday, January 13th. There are no recitations scheduled during the first week of the semester (Monday, January 6th – Friday, January 10th), Martin Luther King Jr. Day (Monday, January 20th), or Spring Break (Monday, March 2nd – Friday, March 6th).

**Attendance at the recitation section for which you are enrolled 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 week’s material. Recitation instructor names and contact information will be posted on D2L.

Course Prerequisites

Students must have achieved a passing grade (1.0 or higher) in CEM 141 in order to take this course. You should also be able to meet the learning objectives from CEM 141. These are posted on D2L.

Before beginning this class, you should be able to do the following:

- Use mathematical terms and equations including: algebra, exponential numbers, logarithms, ratio and proportion
- Use scientific notation appropriately
- Use significant figures appropriately
- Do calculations that require unit conversions
- Use SI units and their appropriate prefix (for example: nano, mega, etc.)
- Make and interpret graphs
- Interpret word problems
Some of these things will be reviewed briefly, but if you cannot do these, you should work especially hard now, or consider delaying this course until you build your background. This background knowledge is expected on all assignments and exams!

**Course Materials and Resources**

**Text:** An electronic 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 on D2L. If you have a general chemistry text from a previous semester it may be a useful resource, but it is not necessary to purchase a new text.

**iClicker Remote:** An iClicker remote is required for this class. You must register your iClicker on D2L before January 13th. You can use either an iClicker+ or an iClicker2, available from a local bookstore or online. iClicker REEF (the mobile app) is NOT allowed. A limited number of free remotes are available to be borrowed from the ASMSU office (http://asmsu.msu.edu/services/iclickers/). Bring your iClicker remote with working batteries to every lecture (including those before January 13th) to earn full credit!

**Websites:**
- [d2l.msu.edu](http://d2l.msu.edu) Class materials and iClicker scores will be posted on D2L.
- [cemscores.chemistry.msu.edu](http://cemscores.chemistry.msu.edu) Course grades and graded copies of exams will be posted on cemscores.
- [besocratic.chemistry.msu.edu](http://besocratic.chemistry.msu.edu) Homework assignments will be posted on beSocratic. More information about the homework system will be distributed separately.

**General Chemistry Office:** Contact the office (room 185 Chemistry) for general course information. The office is open Monday – Friday, 8am – noon and 1pm – 5pm. Telephone: (517) 353–1135

Mr. Todd Burkhart is the General Chemistry Program Coordinator. His office is in the General Chemistry Office. He can answer your administrative (not content) questions about the class. His email address is burkha59@chemistry.msu.edu

**Where to Get Help:** Your lecture instructor’s office hours will be announced in lecture and posted on D2L. Office hours are drop-in (no appointment necessary) or can be scheduled by appointment, as needed. When sending emails to your instructor, please put CEM 142 in the subject line. Your instructor will send emails to your MSU email account. It is your responsibility to ensure that your MSU email account is working properly.

Recitation instructors hold their office hours in the Chemistry Help Room (room 81/83 Chemistry). The schedule will be posted on D2L in the “Syllabus & Help” folder and also outside of the help room. Use the Help Room as often as you like!

Instructors of CEM 142 encourage all students to use the course resources identified on the CEM 142 D2L site. While there are other resources that provide assistance for CEM 142 around campus, the instructors of CEM 142 do not interact with these resources and therefore cannot confirm the content that is being distributed by these groups.
Course Outline: Chemistry, Life, the Universe and Everything.
A detailed outline of the course material and expected outcomes will be provided separately on D2L. We will be studying Chapters 5–9 this semester:

- Chapter 5: Systems Thinking
- Chapter 6: Solutions
- Chapter 7: A Field Guide to Reactions
- Chapter 8: How Far? How Fast?
- Chapter 9: Reaction Systems

CEM 142 Learning Outcomes
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.
- Apply systems thinking to both molecular level and macroscopic systems.
- Identify common types of reactions and predict the products.
- Understand the factors that affect the rate and extent of reactions.
- Predict and explain the outcome of coupled reactions.

Assessment
The assessment in this class will consist of:

<table>
<thead>
<tr>
<th>Assessment Type</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>In-class iClicker questions</td>
<td>5%</td>
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<tr>
<td>In-class activities and homework (group or individual)</td>
<td>15%</td>
</tr>
<tr>
<td>Three in-term examinations (15% each)</td>
<td>45%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>20%</td>
</tr>
<tr>
<td>Recitation</td>
<td>15%</td>
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iClicker
Lecture attendance will be monitored by your responses to iClicker questions. You will only earn iClicker credit in the lecture section that you are registered to attend. You will automatically receive attendance credit for each lecture if you respond to more than 75% of the questions asked on that day. There are no excused absences in CEM 142. All students are allowed to miss three lectures for any reason (including, but not limited to, iClicker not working, athletic event, grief absence request, illness, injury, religious holiday, military training, family emergency, civic duty, etc.) without penalty to your iClicker score.

Bringing another student’s iClicker to class is not allowed. If a student is found to be using another student’s iClicker in lecture, neither student will receive credit for the day and both students will be cited for academic dishonesty. For more information refer to the Spartan Code of Honor, Integrity of Scholarships and Grades and the Student Rights and Responsibilities documents.

Register your iClicker on D2L (not on the iClicker website). To receive credit, you must correctly register your iClicker by Monday, January 13th. You can register your iClicker after January 13th to begin earning credit, but credit prior to your registration date may not be awarded. All lectures, including those before January 13th, will count toward your iClicker credit.
beSocratic Homework
Homework will be assigned after each lecture in the online beSocratic system. To access your assignments, go to besocratic.com and log in with your MSU NetID and password to select the assignment from the list of available assignments. Homework assignments will be due before each lecture throughout the semester. Specific due dates will be provided with the assignment name in the lecture slides. There are no make-ups or extensions offered for missed beSocratic assignments. All students are allowed to miss or not complete two beSocratic assignments for any reason (including, but not limited to, technical problems (beSocratic or computer not working), athletic event, grief absence request, illness, injury, religious holiday, military training, family emergency, civic duty, etc.) without penalty. Your two lowest homework scores will be dropped automatically at the end of the semester.

Examinations
There will be three in-term exams during the semester on Wednesday evenings and a final exam at the end of the course. Alternate exams will be offered on Wednesday mornings at 6:30am if you have a scheduling conflict. You must take the final exam at the assigned time to receive a passing grade in the course. Room assignments for all examinations will be announced later. Students registered with RCPD must contact the General Chemistry Office to arrange your exam start time and location.

Students can use any stand-alone calculator during exams. Calculators on a cell phone or other device that has communication capability are not allowed. Chemical information should not be stored on the calculator that is used during an exam. Calculator applications that contain the periodic table or other chemical information should be removed from your calculator before the exam begins. Any student found with unauthorized chemical information on their calculator will receive a grade of zero for the exam and will be cited for academic dishonesty.

Students are expected to take all exams. In the event of an illness or extenuating circumstance, you must notify the General Chemistry Office prior to the start of the exam. Appropriate documentation may be required. If you cannot take the exam at the assigned time and you have notified the General Chemistry Office to receive approval for missing the exam, your final exam score will count for both the missed exam score and the final exam score.

The final examination counts for 20% of your course grade. This exam is cumulative and will cover material from the CEM 141 and CEM 142. If your final exam score is above 65% and it is to your advantage, your final exam score will replace your lowest in-term exam score. Note that only one exam score will be replaced with the final exam score.

<table>
<thead>
<tr>
<th>Examination</th>
<th>Date</th>
<th>Time</th>
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<tbody>
<tr>
<td>Exam 1</td>
<td>Wednesday, February 5th</td>
<td>7:15 – 8:35pm</td>
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<tr>
<td>Exam 2</td>
<td>Wednesday, March 18th</td>
<td>7:15 – 8:35pm</td>
</tr>
<tr>
<td>Exam 3</td>
<td>Wednesday, April 15th</td>
<td>7:15 – 8:35pm</td>
</tr>
<tr>
<td>Final Exam</td>
<td>Friday, May 1st</td>
<td>10:00am – 12:00pm (noon)</td>
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Recitation
There are thirteen recitations during the semester and you will receive credit for work done in eleven recitation sessions – 10 points each week (5 points for arriving to recitation on-time and 5 points for working with your team on the assigned activity for the entire recitation session). If you finish the recitation activity early, you are expected to work on other chemistry problems with your team until your recitation session is scheduled to end. If you leave early or do not contribute to the team’s work, you will not receive your 5 participation points. Your recitation instructor’s name and email address will be provided to you on the first day of recitation and will be available on D2L.

Students are expected to attend recitation each week. However, in the event of an illness, grief absence, athletic event, religious holiday, military training, or any other extenuating circumstance, you can miss up to two recitation sessions without penalty to your recitation score. If you miss a recitation, you are responsible for the material covered in that recitation session. Two recitation scores will be dropped at the end of the semester. It is
the responsibility of the student to sign the weekly attendance sheet. Any attendance disputes will be resolved using the sign-in sheet for the recitation session in question.

**Grading Scale**
Standard rounding rules apply to the course grading scale (for example, a 79.49% would round down to a 79% whereas a 79.50% would round up to an 80%). Course grades will be assigned on the following average score range:

<table>
<thead>
<tr>
<th>Percentage Range</th>
<th>Grade</th>
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<tbody>
<tr>
<td>90% through 100%</td>
<td>4.0</td>
</tr>
<tr>
<td>85% through 89%</td>
<td>3.5</td>
</tr>
<tr>
<td>80% through 84%</td>
<td>3.0</td>
</tr>
<tr>
<td>75% through 79%</td>
<td>2.5</td>
</tr>
<tr>
<td>70% through 74%</td>
<td>2.0</td>
</tr>
<tr>
<td>65% through 69%</td>
<td>1.5</td>
</tr>
<tr>
<td>60% through 64%</td>
<td>1.0</td>
</tr>
<tr>
<td>below 60%</td>
<td>0.0</td>
</tr>
</tbody>
</table>

**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 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 help you 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 overwhelmed initially. It is completely normal to not immediately understand many of the ideas that you will encounter in chemistry. But be patient – 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 the instructors 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 homework discussion, short lectures, clicker questions, and group activities. We welcome questions, and will do our best to help you, but 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. We will do our best to make sure you understand when it is okay to discuss work with others and when you should not. It goes without saying that all exams are your own work.

As members of this class, students are expected to respect the intellectual property of the course instructors. The instructors of CEM 142 do NOT give permission for any student to post our class materials or to sell any course materials to other students or companies. Taking our course materials and selling them to a company is in violation of point 9 from the MSU Code of Teaching Responsibility. Any student violating the conditions described above may face academic disciplinary sanctions.

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. Present a hard copy of this form to your instructor during office hours (we will not discuss VISA accommodations in the lecture hall) 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. Alternative formats of all course documents are available upon request.

RVSM Policy and Mandatory Reporting
Michigan State University is committed to fostering a culture of caring and respect that is free of relationship violence and sexual misconduct, and to ensuring that all affected individuals have access to services. For information on reporting options, confidential advocacy and support resources, university policies and procedures, or how to make a difference on campus, visit the Title IX website at titleix.msu.edu.

Limits to confidentiality. Essays, journals, and other materials submitted for this class are generally considered confidential pursuant to the University's student record policies. However, students should be aware that University employees, including instructors, may not be able to maintain confidentiality when it conflicts with their responsibility to report certain issues to protect the health and safety of MSU community members and others. As the instructor, I must report the following information to other University offices (including the Department of Police and Public Safety) if you share it with me:

- Suspected child abuse/neglect, even if this maltreatment happened when you were a child;
- Allegations of sexual assault, relationship violence, stalking, or sexual harassment; and
- Credible threats of harm to oneself or to others.

These reports may trigger contact from a campus official who will want to talk with you about the incident that you have shared. In almost all cases, it will be your decision whether you wish to speak with that individual. If you would like to talk about these events in a more confidential setting, you are encouraged to make an appointment with the MSU Counseling and Psychiatric Services.