

## CHM2096 – General Chemistry for Engineers – Spring 2015

Lectures: T 6<sup>th</sup> and R 6<sup>th</sup>-7<sup>th</sup> Periods in Flint 50

Discussion sections: Fridays

**INSTRUCTOR:** Dr. Maria Korolev

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Office hours: MWF periods 9 - 10 and TR periods 8 - 9 in Flint 251

### REQUIRED MATERIALS (provided as a free-trial by Pearson):

Chemistry: A Molecular Approach by Nivaldo Tro, e-book and paperback

MasteringChemistry with LearningCatalytics, online software with access code

### COURSE SCHEDULE (the lecture schedule is tentative, but exam dates will not change)

Topic	Chapter	Dates
Chemical Equilibria	14	1/6-1/9
Acids and Bases	15	1/12-1/23
Ionic Equilibria	16	1/26-2/2
<b>Exam I</b>		<b>2/4 (8:20pm)</b>
Gas-Phase Equilibria	14	2/6-2/13
Thermodynamics	6	2/16-2/18
Thermodynamics	17	2/20-3/9
<b>Exam II</b>		<b>3/11 (8:20pm)</b>
Electrochemistry	18	3/13-3/27
Transition Metal Chemistry	24	3/30-4/8
<b>Exam III</b>		<b>4/9 (8:20pm)</b>
Nuclear Chemistry	19	4/10-4/17
Organic Chemistry	20	4/20-4/22
<b>Final Cumulative Exam</b>		<b>4/25 (7:30am)</b>

**Holidays (no classes):** January 19<sup>th</sup>, March 2<sup>nd</sup> – 6<sup>th</sup> (Spring Break)

**COURSE INFO:** CHM 2096 and CHM 2096L constitute the second semester of the two term sequence of General Chemistry for Engineers, CHM 2095/2045L - 2096/2046L. Prerequisite information and credit suitability can be found in the Undergraduate Catalog. Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found at: <https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>

**COURSE OBJECTIVES:** As both a general education requirement and major's course, CHM2046 serves to teach: the scientific method, skills for problem solving, general chemistry knowledge, and a connection to the principles that govern the natural world.

**GRADES:** Grades for the term will be determined as follows:

Progress Exams (best 2 of 3 @ 250 pts)	500 pts
Final Cumulative Exam	300 pts
Group Mini-Projects	100 pts
MasteringChemistry/LearningCatalytics	100 pts
TOTAL	1000 pts

The following grade cutoffs will be used (these are non-negotiable):

900-1000 = A	860-899 = A-	830-859 = B+	800-829 = B
760-799 = B-	730-759 = C+	700-729 = C	660-699 = D+
630-659 = D	600-629 = D-	< 600 = E	

Information on current UF grading policies for assigning grade points can be found at:

<https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

**CANVAS** (<http://lss.at.ufl.edu>): Here you will find the syllabus, a link to the MasteringChemistry homework site, your gradebook for the class, lecture videos, files, class announcements, and other pertinent info for the course. It is your responsibility to check Canvas often to make sure that you do not miss important announcements and other information and to ensure that your gradebook is accurate. For computer assistance, visit <http://helpdesk.ufl.edu/>.

**CLICKERS AND HOMEWORK:** Ten percent of the course grade (100 points) will be based on performance on in-class clicker questions and online homework. You can earn points in class by correctly answering clicker questions through LearningCatalytics (1 point per each correct answer). You can also earn points by answering online homework problems through MasteringChemistry by the displayed due dates. You can earn up to 100 total points total through both of these combined scores. It is recommended that you do all of the homework problems, even if you are answering questions correctly in class. These will be the best preparation for your progress exams.

**DISCUSSION CLASSES:** Part of your grade will be determined by engineering projects done during your discussion sections. There will be three projects spread over the semester that will relate to material covered in lecture. Each project will be done over three weeks to be done both during discussions and outside the discussions. You will be graded on the scientific merit of your work in groups. More of the details of the activities will be discussed during the 1<sup>st</sup> class meeting. These activities are part of an initiative to improve this section of general chemistry, and are tied to a research grant. Due to this, you will need to complete a consent form as well as pre- and post-semester surveys. Your compliance with this will be worth points that contribute to your overall activities score. Your attendance is required in your registrar assigned section. Although you are graded in groups, points will be taken away for lack of participation. Additionally, you will complete peer-evaluations to provide feedback on each team member and this will affect the points your team members will earn.

**CONTACTING THE INSTRUCTOR / OFFICE HOURS:** Emails are for administrative purposes only, and not for distance-instruction. All academic inquiries must be made during office hours or before/after lectures (if time permits). If this is not possible, visit the CLC (see below). Please be prepared before coming to office hours, bring specific questions and your previous work.

**CLASS DEMEANOR:** In order to have an optimal learning environment, the classroom needs to be free of disruptions. Therefore, it is expected that students come to class on time and leave only when class is concluded by the instructor, and that the class is not disrupted by student talking or cell phone noises.

**CHEMISTRY LEARNING CENTER (CLC):** There is free help to be had from graduate student teaching assistants in the CLC, Monday through Friday in Flint Hall 257. Your discussion TA will have office hours in the CLC, but you may go there anytime any TA is assigned there to get help on questions pertaining to chemistry. A schedule of the TA schedules will be posted in the corridor outside the CLC and also online. Additionally, there is the teaching center located on the ground floor of Broward Hall, if you'd like to use that resource. Their web site is <http://www.teachingcenter.ufl.edu>.

**EXAMS:** Exams will be taken in the evenings outside of class and the Exam Room Assignments will be posted. You must use a non-graphing non-programmable scientific calculator on exams (with log, ln, root, and exponent (scientific notation) functions). Be sure to also bring pencils, section number, and your UF ID card. No notes, papers, cell phones or other electronic devices can be in view during exams.

No makeup ("do over") progress exams will be given for any reason. Conflict exams will be administered for officially sanctioned events and medical reasons as per university policy and this document: [http://iteach.chem.ufl.edu/file.php/1/Exam\\_Absence\\_Policy\\_GChem\\_s13.pdf](http://iteach.chem.ufl.edu/file.php/1/Exam_Absence_Policy_GChem_s13.pdf). If you must be absent for an exam due to a documented and approved academic or UF athletic conflict, bring the documentation to your instructor at least one week prior to the scheduled exam and an early conflict exam will be scheduled for you. To alleviate the stress of potential absences that do not fall under officially-sanctioned absences, we've incorporated a dropped-exam policy (the best 2 of 3 Progress Exams will be counted toward your grade - see under "GRADES" below).

Scantrons may be checked only during office hours the week following the posting of the exam score in your Canvas gradebook. Bubbling errors will not be negotiated, and a 5 point penalty will be applied for failure to bubble in a form code, UFID, or not taking the exam in the assigned room.

**HONOR CODE:** UF students are bound by The Honor Pledge which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." The Honor Code (<https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor of TAs in this class.

**DISABILITIES:** Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, <http://www.dso.ufl.edu/drc/>) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. The student is responsible for scheduling the exam dates with the DRC. Students with disabilities should follow this procedure as early as possible.

**EVALUATIONS:** Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at <https://evaluations.ufl.edu>. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at <https://evaluations.ufl.edu/results/>.

**PROGRAM OBJECTIVES:** Physical science courses provide instruction in the basic concepts, theories and terms of the scientific method in the context of the physical sciences. Courses focus on major scientific developments and their impacts on society, science and the environment, and the relevant processes that govern physical systems. Students will formulate empirically-testable hypotheses derived from the study of physical processes, apply logical reasoning skills through scientific criticism and argument, and apply techniques of discovery and critical thinking to evaluate outcomes of experiments.

These objectives will be accomplished through participation in the course lectures and discussion sections, and individual work done on homework assignments and assessments.

**GENERAL EDUCATION STUDENT LEARNING OUTCOMES:** The following learning outcomes will be assessed through online assessments and examinations.

Area	Institutional Definition	Institutional SLO
<b>CONTENT</b>	Content is knowledge of the concepts, principles, terminology and methodologies used within the discipline.	Students demonstrate competence in the terminology, concepts, methodologies and theories used within the discipline.
<b>COMMUNICATION</b>	Communication is the development and expression of ideas in written and oral forms.	Students communicate knowledge, ideas, and reasoning clearly and effectively in written or oral forms appropriate to the discipline.
<b>CRITICAL THINKING</b>	Critical thinking is characterized by the comprehensive analysis of issues, ideas, and evidence before accepting or formulating an opinion or conclusion.	Students analyze information carefully and logically from multiple perspectives, using discipline specific methods, and develop reasoned solutions to problems.

#### **SPECIFIC GOALS: CHM 2095/2096 (General Chemistry)**

You will be required to analyze scientific concepts and think critically. This means being able to answer both quantitative (mathematical) and conceptual (quantitative) multiple choice problems in a limited period of time. Additionally you will have to write or orally communicate during your discussion periods. We will also demonstrate how these topics can be applied to the scientific method and how observation and experimentation leads us to the development of scientific theories. To achieve this, students will be introduced to the following concepts from the textbook.

You will review the importance of chemistry in our everyday lives. You will be required to utilize the methods of science as a logical means of problem solving through critical thinking. This means you must analyze information carefully and logically from multiple perspectives, using discipline specific methods, and develop reasoned solutions to problems. To ensure your competency in these concepts you will be required to complete online homework assignments and take quizzes and exams that require critical

thinking, analysis of problems and drawing conclusions.

**Critical Thinking:** Critical thinking skills are essential in the general chemistry course. There are six criteria by which we promote critical thinking:

1. Information acquisition: Identifying and differentiating questions, problems and arguments.
2. Application: Assessing the suitability of various methods of reasoning and confirmation when approaching a problem. Students are taught to develop hypotheses and to find support and limitations associated with their hypotheses.
3. Analysis: Identifying and analyzing stated and unstated assumption and using logical reasoning to evaluate different viewpoints.
4. Synthesis: Students are encouraged to formulate questions and problems, construct arguments to address such questions and be able to effectively communicate conclusions.
5. Communication: In discussion of alternative points of view, students will be encouraged to criticize or defend their arguments with the use of logical reasoning and evidence.
6. Evaluation: Assessing the quality of evidence and reasoning to draw reasonable conclusions.

**Mathematics:** It is crucial in the general chemistry course to be competent in mathematics. Listed are the criteria by which we promote understanding and application of math:

1. Information acquisition: Students learn to select data that is pertinent to solving a problem.
2. Application: Use of algebraic, geometric and statistical reasoning to solve problems.
3. Analysis: Interpret and draw conclusions from formulas, graphs and tables.
4. Synthesis: To associate patterns and observations to more abstract principles and to consider specific applications of such principles.
5. Communication: Communicating mathematical information symbolically, graphically, numerically and verbally.
6. Evaluation: Estimate and verify solutions to mathematical problems to determine reasonableness, compare alternatives and select optimal results and understand the limitations of mathematical and statistical methods.

**DISCLAIMER:** This syllabus represents my current plans and objectives. If those need to change as the semester progresses, then the changes will be communicated to the class clearly.