CHEM 101: General Chemistry – Semester 1
Summer 2014 - Session A
Loyola University Chicago

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Office hours:	We will respond to emails and phone messages as quickly as possible and at a minimum within 24 hours except on weekends. Only emails from your Loyola University account will be accepted, and we will only send emails to your Loyola University account. Communications received after 3:00 pm on Friday or over a weekend will be answered on Monday morning at the latest. If you require face-to-face assistance either via the computer or in person, please email one of us to set up an appointment. We can communicate via Skype or can set up a time to meet on campus, preferably immediately before or after a synchronous session.	
Class Meeting Times:	Synchronous sessions are on Mondays and Wednesdays from 9:30-11:30 am. Synchronous sessions will be recorded.	

Course Description
This course is an online general chemistry course for science majors and students in pre-professional health studies. It includes the following topics: matter and measurement; atoms, molecules, and ions; mole mass relationships in chemistry, reactions in aqueous solution; thermochemistry; electronic structure and the periodic table; periodic trends; chemical bonding; molecular geometry and bonding theory; gas laws; and intermolecular forces. Historical and current developments in chemistry as well as real-world problems that chemists address will be incorporated into the course.

The emphasis of this course is on understanding, application, and prediction rather than memorization. This means that students must foster their problem solving skills and their ability to make claims based on evidence. It is not enough to know *what* happens in chemistry, students must also be able to explain *why* it happens.

Prerequisites:
Satisfactory performance on the Loyola math proficiency test or Math 117 (or equivalent) with a grade of C- or better. A year of high school chemistry is recommended.

Required Resources

(1) Brown, LeMay, Bursten, Murphy, Woodward, Stoltzfus (2015). *Chemistry: The Central Science (with MasteringChemistry), 13th ed.* Pearson Prentice Hall. ISBN 978-0-321-91041-7. The *MasteringChemistry* website will be used for homework, quizzes, and exams. The course ID for this course is DaubenmireCHEM101Sum14 (MCDAUBENMIRECHEM10114).

(2) Moog, R.S. & Farrell, J.J. (2015). *Chemistry: A Guided Inquiry, 6th Edition.* (e-text - ISBN : 978-1-118-80640-1, or paperback - ISBN : 978-1-118-64004-3)

(3) *Sakai Connection*, sakai.luc.edu – the course is CHEM 101 003 SU14
Group projects, individual assignments, and other useful information will be posted under the Resources section of Sakai. You will also submit your group work and projects using Sakai and will be able to have group discussions either synchronously or asynchronously using various formats in Sakai. The instructor will monitor your progress in order to ask questions or provide suggestions to make sure you are learning important concepts in chemistry.

(4) Access to the Adobe Connect Virtual Classroom Space. Our class meetings will be held in the following classroom: https://connect.luc.edu/chem1010032014/

(5) A computer with a quality, high speed internet connection (preferably wired) for synchronous sessions and for access to online resources.

(6) A headset with microphone for use during synchronous sessions (listening through computer speakers can cause a large amount of background noise when you turn on your microphone, so a headset is essential).

Course Objectives

Within various measures for student growth at Loyola this course aims to help the student in the following areas**:**

- *Essential Components of the Course (IDEA Objectives). This course aims to help students:*
    - Gain factual knowledge of chemistry (terminology, classification, methods, trends).
    - Learn fundamental chemistry principles, generalizations, or theories.
    - Learn to apply course material in order to improve thinking, problem solving and decision making.
    - Gain a broader understanding and appreciation of the intellectual/cultural activity of science, and
    - Acquire an interest in learning more by asking questions and seeking answers.

- *Connection to the "Hungers" of Loyola University's Transformative Education*
  Within the spirit of Jesuit education traditions and practices, this course seeks to assist each student in fostering hungers associated with the University's model of transformative education.[1] The study of introductory chemistry can also assist in development of the specific hungers below:
    - A Hunger for Integrated Knowledge – by building an understanding of a variety of chemical concepts and applying them to problems in many contexts.

[1] http://www.luc.edu/transformativeed/

- A Hunger for a Moral Compass – by examining the variables, benefits, and detriments that exist at the interface of applied science, technology, environment, and society.
- A Hunger for a Global Paradigm – by examining the variables, benefits, and detriments that exist at the interface of applied science, technology, environment, and society.

Instructional Format

This course will not follow a traditional lecture format for delivery of course content and skill development. While there may be some lectures during the synchronous time, the course will focus more on eliciting students' current ideas and thoughts about sets of data or presented models that are posted online or part of course activities. Then, through guided questions about the presented information, students, in small groups, discuss ideas and come to consensus about answers to questions. Ideas are further developed in questions that force application of the agreed upon concepts. The instructor is the guide on this journey, pointing out areas that are particularly relevant or that may need attention. This format is designed based on the idea that learning cannot be directly transmitted from one person to another. Knowledge must be built by the learner which results from interpretation and reflection on experiences in particular contexts, such as the chemistry classroom, when working with others and guided by a mentor.

Academic Honesty

Academic honesty is an expression of interpersonal justice, responsibility and care, applicable to Loyola University faculty, students, and staff, which demands that the pursuit of knowledge in the university community be carried out with sincerity and integrity. The School of Education's Policy on Academic Integrity can be found at: http://www.luc.edu/education/academics_policies_integrity.shtml.

The definitions of cheating, plagiarism, fabrication, and falsification are given at this site will be used in determining whether a student has violated academic integrity. Additionally, a clear and thorough discussion of plagiarism, including examples, can be found on the English Department's website at http://www.luc.edu/english/writing.shtml#source

All students in this course are expected to have read and to abide by the demanding standard of personal honesty, drafted by the College of Arts & Sciences, that can be viewed at: http://www.luc.edu/cas/pdfs/CAS_Academic_Integrity_Statement_December_07.pdf

Anything you submit that is incorporated as part of your grade in this course (*e.g.*, quiz, examination, homework, paper, presentation) must represent your own work. Any student found to have cheated on, plagiarized, fabricated, or falsified any portion of a test or assignment will receive a zero on that test or assignment and this grade cannot be dropped. The student has the right to appeal the instructor's decision. If the student does so, the Academic Grievance Procedure described at http://www.luc.edu/academics/catalog/undergrad/reg_academicgrievance.shtml will be followed. If a student is found to have cheated on, plagiarized, fabricated, or falsified any portion of a test or assignment for a second time in this class, they will receive an F for the class. In all cases of academic dishonesty, the instructor will report the incident to the Office of the CAS Dean. Depending on the seriousness of the incident, additional sanctions may be imposed.

Accessibility
Students who have disabilities which they believe entitle them to accommodations under the Americans with Disabilities Act should register with the Services for Students with Disabilities (SSWD) office. To request accommodations, students must schedule an appointment with an SSWD coordinator. Students should contact SSWD at least four weeks before their first semester or term at Loyola. Returning students should schedule an appointment within the first two weeks of the semester or term. The University policy on accommodations and participation in courses is available at: http://www.luc.edu/sswd/

Harassment (Bias Reporting)
It is unacceptable and a violation of university policy to harass, discriminate against or abuse any person because of his or her race, color, national origin, gender, sexual orientation, disability, religion, age or any other characteristic protected by applicable law. Such behavior threatens to destroy the environment of tolerance and mutual respect that must prevail for this university to fulfill its educational and health care mission. For this reason, every incident of harassment, discrimination or abuse undermines the aspirations and attacks the ideals of our community. The university qualifies these incidents as incidents of bias.

In order to uphold our mission of being Chicago's Jesuit Catholic University-- a diverse community seeking God in all things and working to expand knowledge in the service of humanity through learning, justice and faith, any incident(s) of bias must be reported and appropriately addressed. Therefore, the Bias Response (BR) Team was created to assist members of the Loyola University Chicago community in bringing incidents of bias to the attention of the university. If you believe you are subject to such bias, you should notify the Bias Response Team at this link: http://webapps.luc.edu/biasreporting/

Course Evaluation
Grades will be assigned in the course according to the following sources:

Table 1. Grade Criteria

Criteria	Maximum Percent Value
Online participation and group responses	5%
Online homework sets	5%
Online quizzes	5%
Individual project	10%
Tests	40%
Final Exam	35%

Participation, group responses, and reports will be an important part of the class. This work will be a combination of individual and group work. Students must be present during synchronous class sessions and must be posting relevant information and questions online when engaged in group projects in order to receive credit for these assignments. Participation involves completing assignments and using pertinent data to take part in group work, add to discussions, and make reasoned conclusions or decisions. This will include being able to ask questions of others and to evaluate arguments and conclusions made by others.

Quizzes will follow after each session using *MasteringChemistry*. Quizzes will be available during specific blocks of time outside of the synchronous sessions and will be timed so that you have a specific amount of time once you have opened the quiz to complete it. Content from work conducted during the study of the material (synchronous sessions, group work, individual work, and homework) will be the source of material on each quiz. The two lowest quiz scores will be dropped from your course evaluation.

Online Homework Sets using *MasteringChemistry* will be assigned each week. Submitted responses must be the result of your individual effort and synthesis and must be submitted by noon each Thursday. While you can work with classmates on homework, you need to ensure that you understand how to do the assigned problems so that you are able to do them without help from others. Please note that the due date may or may not be a date that the class meets synchronously. Late assignments may not be accepted, and verification of reasons may be requested.

One *Project* will be assigned that involves analysis of issues that involve aspects of chemistry and that are important in the world today but that are not directly covered in this beginning course in chemistry. This will incorporate scientific, economic, and policy considerations of current issues. Further details regarding this project, including grading via a rubric, will be presented in class.

Online tests will be administered at two different points during the course. Each will primarily reflect the content and concepts developed during prior class sessions. These will be administered using *MasteringChemistry*. Tests will be available during specific blocks of time outside of the synchronous sessions and will be timed so that you have a specific amount of time once you have opened the test to complete it.

The *Final Exam* will be online and is designed to assess students comprehensive knowledge of concepts developed during the work of the entire semester. It will be administered using *MasteringChemistry*. The final exam will be available during a specific block of time outside of the synchronous sessions and will be timed so that you have a specific amount of time once you have opened the exam to complete it.

Grades will be assigned according to the grading scale presented in Table 2.

Table 2: Grading Scale

Percentage of Points Earned	**Grade**
92% or greater	A
<92% - 90%	A-
<90% - 88%	B+
<88% - 82%	B
<82% - 80%	B-
<80% - 78%	C+
<78% - 72%	C
<72% - 70%	C-
<70% -68%	D+
<68% - 60%	D
<60%	F

Practices for Success

Supporting claims with evidence, making applications, solving and analyzing problems, and using scientific principles to explain phenomena are critical skills in the field of science. The development of these skills is not without some frustration, but it carries the reward of deepening one's ability to think critically and solve problems in any field. To do this, one may have to assess, evaluate, and possibly revise approaches to learning. The use of targeted, guiding questions, regularly scheduled work, and strategic study plans can greatly assist the learning of science. With such a focus, hopefully any frustration will quickly turn to appreciation and fascination for the relevance and connectedness of science in your life and the world around you. Solving and analyzing problems is the most important feature of this work. If, at any time, you need assistance framing such plans for your work in science, please do not hesitate to ask the instructor.

Norms of Course Proceedings

The online environment that is our classroom is to be a safe place to question and explore ideas. Student and teacher voices are important to this work. Collegial disagreement can be a healthy part of this process, but must always include respect for all members of the class.

Course activities will be designed to help students reach the goal of learning chemistry content and developing thinking skills. This will more often be driven by the use of data and reasoning to discover concepts and solutions rather than the identification and exchange of facts and algorithms.

Synchronous class sessions will begin and end on time. All students should attend these synchronous classes regularly and participate in class discussions both during these times and asynchronously online. Multiple absences from synchronous sessions or lack of involvement in online activities and discussions could affect one's ability to learn chemistry during this semester. Anticipated absences or difficulties in completing group work and other online assignments should be discussed with the instructor. For synchronous sessions, please contact the instructor at least two days before a synchronous session if you will be unable to attend. Proper documents may be requested to verify the reason for any absence. This is particularly relevant to days missed that include an in-class assessment for which a student is asking for a make-up.

Synchronous time is designed to engage students in activities that advance their understanding of chemistry. Electronic media, including cell phone, texting devices, laptops, and tablets should be used only as they enhance the activity of the class. In general, cell phones and texting devices should be turned off during synchronous class time. If you expect that you might receive an emergency phone call or text during this time, please set your phone so that it will not distract other participants in the course and away to answer a call if necessary.

Email messages and other electronic communication among students in the course should be respectful, appropriate, and professional. The instructor will respond to emails and phone messages as quickly as possible and at a minimum within 24 hours except on weekends. Only emails from your Loyola University account will be accepted, and the instructor will only send emails to your Loyola University account. Communications received after 3:00 pm CDT on Friday or over a weekend will be answered on Monday morning at the latest.

Completed course assignments must be submitted by the end of the day (11:59 pm CDT) on the due date. Please note that the due date may or may not be a date that the class meets synchronously. Late assignments will not be accepted without proper verification of reasons.

Course Schedule and Assignments

Table 3. Proposed Semester Topics & Schedule

Dates	Topics
Pre-course Orientation: May 14	This will be a synchronous session starting at 9:30 a.m. to help orient students to the online classroom and tools we will be using in this course. This session will be recorded and posted on Sakai.
Week 1: May 19-23	Synchronous Session, 9:30-11:30 am Monday, May 19: Matter and Measurement (BLBMWS, Chapter 1 - review) Atoms (Moog, CA 1, 2; BLBMWS, Chapter 2, Sections 1-4)
	Synchronous Session, 9:30-11:30 am Wednesday, May 21: Coulombic attractions and the Shell Model of Atoms (Moog, CA 3, 4, 5; BLBMWS, Chapter 2, Section 5 and Chapter 7)
Week 2: May 26-30	Memorial Day: Monday, May 26 : No synchronous session.
	Synchronous Session, 9:30-11:30 am Wednesday, May 28: Electron behavior & Periodic Properties (Moog, CA 7, 8; BLBMWS, Chapter 6, Sections 1-4)
Week 3: June 2-6	Synchronous Session, 9:30-11:30 am Monday, June 2: Many-Electron Atoms and Electron Configurations (Moog, CA 9, 10; BLBMWS, Chapter 6, Sections 7, 8)
	Synchronous Session, 9:30-11:30 am Wednesday, June 4: Electron Configurations and the Periodic Table, Molecules, Ions, Lewis Structures (Moog, CA 11, 13; BLBMWS, Chapter 6, Section 9; Chapter 2, Sections 6, 8; Chapter 8, Section 1)
	Exam 1 (BLBMWS Chapters 1, 2, 6, 7), Friday, June 6 (This is a timed exam and must be completed by 5:00 pm CDT)
Week 4: June 9-13	Synchronous Session, 9:30-11:30 am Monday, June 9: Covalent Bonding and Lewis Structures (Moog, CA 14, 15; BLBMWS, Chapter 8, Sections 3, 5, 6, 8)
	Synchronous Session, 9:30-11:30 am Wednesday, June 11: Basic Concepts of Chemical Bonding (Moog, CA 18, 22; 24; BLBMWS, Chapter 9; Chapter 2, Section 7; Chapter 8, sections 2, 4, 7)
	Project Due, Friday, June 13 at 5:00 pm CDT.
Week 5: June 16-20	Synchronous Session, 9:30-11:30 am Monday, June 16: Liquids, Intermolecular Forces, and the Mole (Moog, CA 27, 28; BLBMWS, Chapter 11; Chapter 3, Section 4)
	Synchronous Session, 9:30-11:30 am Wednesday, June 18: Molecular Geometry and Bonding Theories (Moog, CA 29; 30; BLBMWS, Chapter 3, Sections 1-3, 6, 7)

	Exam 2 (Chapters 3, 8, 9, 11), Friday, June 20 (This is a timed exam and must be completed by 5:00 pm CDT)
Week 6: June 23-27	Synchronous Session, 9:30-11:30 am Monday, June 23: Emperical Formulas, Reactions in Aqueous Solution (Moog, CA 31; 32; BLBMWS, Chapter 3, Section 5; Chapter 4, Sections 1, 5, 6)
	Synchronous Session, 9:30-11:30 am Wednesday, June 25: Gases, Thermochemistry (Moog, CA 33; 35; BLBMWS, Chapter 10; Chapter 5)
	Final Exam – (Comprehensive over the entire semester), June 27 (This is a timed exam and must be completed by 5:00 pm CDT)

Information from other chapters may be introduced by the instructor as appropriate to specific topics. Additionally, other chapters may be helpful to students in completion of the course projects.