CHEM 101: General Chemistry – Semester 1
Summer 2018 - Session A
Loyola University Chicago

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Class Meeting Times:	Synchronous meetings times for small groups in this course will be offered Mondays and Tuesdays at 11:30-1:00 pm and 6:30-8:00 pm. You will be assigned to one time slot each week based on your response to an online survey. Please see sakai for more information.

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 (2017). *Chemistry: The Central Science (with MasteringChemistry*), *14th ed.* Pearson Prentice Hall. ISBN 978-0134414232. The *MasteringChemistry* website will be used for homework, quizzes, and exams. The course ID for this course is: **CHEM101Sum18Daubenmire**

(2) Moog, R.S. & Farrell, J.J. (2017). *Chemistry: A Guided Inquiry, 7th Edition*. ISBN : 9781119110705

(3) *Sakai Connection*, sakai.luc.edu – the course is CHEM 101 001 SU18.
Group projects, individual assignments, and other useful information will be posted under the Resources section of Sakai. Voice threads with important content will be posted on Sakai as well. 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 Zoom Classroom Space. Our weekly synchronous session will be held in a virtual classroom and can be accessed through our Sakai page via the Zoom tab.

(5) Access to Zoom Small group meeting space that will be accessed directly through an internet link and not via sakai.

(6) Access to GroupMe app for mobile devices and smart phones.

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

(8) 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 a basic understanding of chemistry factual knowledge of chemistry (e.g. factual knowledge, methods, principles, generalization, 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
    - Learn how to find, evaluate, and use resources to explore a topic in depth.

- *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.
    - 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 run mostly asynchronously, having both individual and group tasks and assignments. While there will be short recorded lectures available for viewing, 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, via small group interactions will 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(s) guide you 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.

In this context we include required, group online synchronous sessions for students to discuss ideas and ask questions in real time. You will be assigned into groups and to an assigned meeting times, shared earlier. Zoom meeting rooms will be assigned to you for this meeting time. You may also and are encouraged to submit questions or other discussion points prior to these sessions so that we can address your needs in a timely manner.

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

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

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.pdf2

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	10%
Online homework sets & activities	15%
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. 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. This type of dialog will take place via shared answers on discussion boards or in other online assignment sharing.

Online Homework Sets & Activities using *MasteringChemistry* will be assigned each week. Submitted responses must be the result of your individual effort and synthesis and must be submitted by 10 pm on each Wednesday. 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. Late assignments may not be accepted, and verification of reasons may be requested.

Online tests will be administered at two different points during the course. These will be administered using *MasteringChemistry*. Tests will be available during specific blocks of time 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 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.

Email messages and other electronic communication among students in the course should be respectful, appropriate, and professional. One of the instructors 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. Though concerted efforts will be made to respond as soon as possible, communications received after 3:00 pm on Friday or over a weekend will be answered on Monday morning at the latest.

If you require assistance either via the computer or in person, please email us to set up an appointment. We can communicate via Skype or our Zoom Classroom or can set up a time to meet on campus.

Completed course assignments must be submitted by 11:30 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.

Please note enrollment conditions for CHEM 101 and 111. Students who drop the co-req lecture (CHEM 101) must be receiving a grade of D or better in the lecture in order to continue in the co-req lab (CHEM 111).

Course Schedule and Assignments

Table 3. Proposed Semester Topics & Schedule

Dates	Topics
Week 1: May 21-27	*Matter and Measurement* (BLBMWS, Chapter 1 - review) *Atoms* (Moog, CA 1, 2; BLBMWS, Chapter 2, Sections 1-4) *Nuclear Chemistry* (Supplemental CA 63, 64; BLBMWS, Chapter 21 (except 21.4))
Week 2: May 28-June 3	*The Shell Model of Atoms* (Moog, CA 4-6; BLBMWS, Chapter 2, Section 5; Chapter 7, Sections 1-4, 6-8); *Electron Behavior & Configurations* (Moog, CA 9-11; BLBMWS, Chapter 6, Sections 1-4 (for section 4, you will not need to do any mathematical calculations), 7 (only the "Orbitals and Their Energies" section), 8 (not "The Lanthanides and Actinides" section), 9; Chapter 7, Section 4 (electron configurations of ions)) **Test 1: Friday, June 1 (This is a timed exam on masteringchemistry.com and must be completed by 11:30 pm CDT)**
Week 3: June 4-10	*Chemical Bonding & Lewis Structures* (Moog, CA 13-15; BLBMWS, Chapter 2, Sections 6, 8, 9 (only alkanes & alcohols); Chapter 8, Sections 1, 3, 5, 6, 8) *Resonance, Formal Charge & Extended Octets in Lewis Structures* (Moog, CA 16-17; BLBMWS, Chapter 8, Sections 6, 7) *Molecular Shape & Hybridization* (Moog, CA 18-19; BLBMWS, Chapter 9, Sections 1-6)
Week 4: June 11-17	*Different Types of Bonds* (Moog, CA 22, 24, 25; BLBMWS, Chapter 2, Section 7; Chapter 8, Sections 2, 4; Chapter 12, Section 4 ("Electron-Sea Model" only)); *The Mole & Gases* (Moog, CA 28, 32, 33; BLBMWS Chapter 3, Section 4; Chapter 4, Sections 1, 5; Chapter 10, Sections 1-7, 9) **Test 2: Friday, June 15 (This is a timed exam on masteringchemistry.com and must be completed by 11:30 pm CDT)**

Dates	Topics
Week 5: June 18-24	*Chemical Equations and Stoichiometry* (Moog, CA 29 & 30; BLBMWS, Chapter 3, Sections 1-3, 6, 7) *Empirical Formulas, Reactions in Aqueous Solution* (Moog, CA 31; BLBMWS, Chapter 3, Section 5; Chapter 4, Sections 4 & 6)
Week 6: June 25-June 29	*Thermochemistry* (Moog, CA 34, 35; BLBMWS, Chapter 5, Sections 1-4, 6 & 7) **Final Exam – (Comprehensive over the entire semester), June 29 (This is a timed exam on masteringchemistry.com and must be completed by 11:30 pm CDT)**

Information from other chapters may be introduced by the instructor as appropriate to specific topics.