

CHEM 101: General Chemistry A

Spring 2014

Lecture: Mon., Wed., & Fri. 8:15 - 9:05 AM Cuneo 210

Discussion: (002) Th. 8:30 - 9:45 AM Crown Center 114
(003) Th. 10:00AM - 11:15 AM Crown Center 114

Instructor: George Chlipala, Ph.D.

Email: gchlipala@luc.edu - begin subject line with "CHEM 101-001" to receive a response

Office: Flanner 200A

Office Hours: Mon. 9:30 - 10:30 AM, Wed. 1:00 - 2:00 PM, Fri. 10:00 - 11:00 AM

Course Description

This course is the first part of a two-semester sequence in general chemistry. The course deals with the development of basic chemical principles. Topics include atomic and molecular structures, states of matter, energetics and stoichiometry of reactions.

Prerequisite: A satisfactory performance on the Loyola math proficiency test; or completion of Math 117 with a grade of C- or better.

Co-requisite: CHEM 111 - General Chemistry Laboratory A

Intended audience: For non chemistry majors and students in the B.A. Chemistry program.

Required Texts and Materials

Text: *Chemistry: The Central Science* 12th ed. (2011) Brown, T. E.; LeMay H. E. H.; Bursten, B. E.; Murphy, C.; Woodward, P. Prentice Hall. 2011. ISBN: 978-0-321-69672-4

Online access: Access to MasteringChemistry

Scientific calculator: Any scientific calculator is acceptable as long as it is capable of scientific notation. The ability to graph is NOT required. You are responsible for understanding how to use your calculator prior to any quizzes or exams. Please bring your calculator to every class session, *especially* quizzes and exams. Sharing of calculators during quizzes or exams is not allowed. The instructor will NOT provide calculators. *Use of cell phones as a calculator will NOT be permitted during quizzes or exams.*

Course Objectives

Upon successful completion of this course, students will be able to:

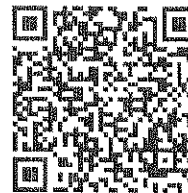
- Understand the fundamental principles, methodology, terminology and scientific method used in chemistry.
- Have sufficient knowledge of physical and chemical properties of common substances.
- Apply knowledge acquired in this class to related disciplines as well as daily issues of public interest.

Method of Instruction

Lecture, group discussion, online exercises, assignments and research updates. Students are encouraged to come into the office during the instructor's office hours for help of the course. Also tutorial services are made available by the college.

Academic Integrity

Students are encouraged to study with other students, however assignments, quizzes, and examinations are designed to evaluate the knowledge and understanding of an *individual* and should be the product of one's own work. Plagiarism and cheating of any kind are serious violations and will result, minimally, in the grade of *zero* for the item with the possibility of an automatic failing grade for the course as well as referral to the Dean's office. For more information on the Academic Integrity policy at Loyola University please visit: http://luc.edu/academics/catalog/undergrad/reg_academicintegrity.shtml



Student Conduct

Students are expected to conduct themselves in a manner which is considerate of the rights of others and which will not impair the educational mission of the University. Misconduct for which students are subject to disciplinary action by the University may include the following:

1. All forms of dishonesty such as stealing, forgery, or plagiarism
2. Obstruction or disruption of teaching, research, administration, or disciplinary proceeding
3. Physical or verbal abuse, threats, intimidation, harassment, and/or other conduct that threatens or endangers the health or safety of any person.

Email communications

Emails between the instructor and students are formal communications, and I expect the language and format of your emails to reflect that. When you send me an email, use a subject line that reflects the purpose of your email. It is always best to put 'CHEM 101-001' in the subject line. It is also inappropriate to begin the body of an email without a salutation such as "Dear Dr. Chlipala." "Hey" is not a proper salutation. I expect full sentences and proper language in emails, and may not respond to emails in inappropriate formats.

E-mail may provide us access to rapid communication but do not expect an immediate response. I will try to respond in a timely fashion but, I may not be able to respond to your email if I am away from the office, e.g. teaching, weekends, or after 5pm.

Classroom Etiquette

Students are expected to conduct themselves in a manner appropriate to a place of study and knowledge.

- *The following items are specifically forbidden during exams and quizzes*
 - Cellphones as a calculator
 - Periodic table (I will provide it for you), notes, homework and scratch paper
 - Formulae (on occasion, I will provide formulae, otherwise you have to memorize them)
- Students are required to treat other students and instructors with respect.
- Refrain from talking and laughing and other destructive behavior. If you have questions, ask the instructor.

Grading

The final grade will be based on the following:

2 (of 3) midterm exams × 100 points = 200
10 (of 12) discussion exercises × 10 points = 100
10 online exercises × 10 points = 100
Final exam = 200
TOTAL = 600 points

Grading Scale

Percentage	Points	Grade
≥ 93%	≥ 558	A
< 93% – 89%	557 – 534	A-
< 89% – 85%	533 – 510	B+
< 85% – 82%	509 – 492	B
< 82% – 78%	491 – 468	B-
< 78% – 74%	467 – 444	C+
< 74% – 69%	443 – 414	C
< 69% – 65%	413 – 390	C-
< 65% – 50%	390 – 300	D
< 50%	< 300	F

The course will not be graded on a curve

Grades will be available on Sakai (<http://sakai.luc.edu>). It is the students responsibility to check his/her grade. You have two weeks from when the grade is posted to report errors. If I do not receive an email, the grade posted will stand.



I will give you many opportunities to gather points, Your Final grade is *SOLELY* dependent on your points *ACCUMULATED* throughout the semester.

Examinations

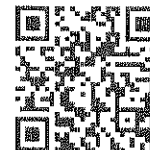
Each major examination will focus on specific chapters/topics but may include any concepts that have been discussed before, helping the students to integrate the materials. Make-up examinations will be given **ONLY** for **reasonable AND documented** excuses. The *reasonable* nature of an excuse will be determined if absence was due to some other obligation, e.g. illness, court appearance, religious obligation, death of close relative, and representing the University in an official capacity. *You must notify the instructor at least one week before any scheduled absences*, i.e. in which the date is known ahead of time,

Discussion Exercises

There will be a minimum of twelve (12) exercises given during the discussion sections. The best ten (10) scores will be used for grading and there will be **NO** makeup exercises. If we have a exercise and you are late, you are cutting your own time. I will not extend time for you.

Online exercises

MasteringChemistry will be used for online exercises. You will need to register with MasteringChemistry to access these exercises. A separate information sheet is attached that details instructions on accessing the course website for MasteringChemistry. Online exercises will be available for all 11 chapters covered in this course. The best 10 scores will be used in calculating your final grade.



Final Exam

The final exam will be held Monday, May 5th at 9:00 - 11:00 AM. This exam will be cumulative, i.e. covering chapters 1-11.

Practice problems

Additional practice problems are given to reinforce and review basic concepts. Students are strongly encouraged to solve these problems. If you have any questions about some particular problems, ask during discussion sections or stop by during office hours. Some questions from the practice problem set might be included in major exams.

Solving chemistry problems requires practice. Students who solve practice problems correctly, generally do well in quizzes and exams.

- Solve each of these problems individually or with a fellow classmate.
- Some of these problems might be given in exercises, quizzes or major exams.
- Some problems have answers at the back of your book, you may use the solutions notebook as a resource in open notes group discussions and problem solving.

Chapter 1: 5, 7, 9, 11, 13, 17, 19, 23, 25, 27, 29, 33, 35, 37, 39, 43, 45, 47, 53, 62, 65, 71, 77

Chapter 2: 1, 4, 6, 15, 17, 19, 21, 23, 27, 29, 31, 39, 41, 43, 45, 47, 49, 53, 57, 59, 63, 65, 69, 73, 87, 90, 93, 98, 101, 104

Chapter 3: 1, 3, 5, 7, 11, 13, 17, 19, 23, 27, 29, 31, 33, 39, 43, 47, 51, 53, 57, 61, 63, 67, 69, 71, 75, 77, 81, 83, 85, 89, 93, 101, 105

Chapter 4: 1, 5, 7, 9, 15, 17, 21, 23, 27, 31, 37, 39, 41, 45, 49, 51, 55, 61, 63, 67, 69, 71, 73, 75, 79, 81, 83, 85, 87, 89, 92, 94, 96, 99, 103, 106, 109, 112

Chapter 5: 5, 11, 13, 19, 21, 25, 27, 31, 37, 39, 41, 43, 45, 47, 51, 53, 55, 61, 63, 65, 67, 69, 73, 75, 79, 102, 106

Chapter 6: 2, 5, 8, 11, 13, 15, 17, 23, 27, 31, 33, 35, 39, 43, 45, 49, 51, 53, 55, 59, 63, 67, 69, 71, 73, 75, 85, 90, 94, 97

Chapter 7: 7, 11, 15, 21, 23, 25, 27, 29, 31, 33, 37, 39, 41, 45, 47, 53, 55, 61, 63, 65, 71, 77, 88, 95, 103

Chapter 8: 1, 4, 7, 9, 13, 15, 19, 31, 33, 35, 37, 39, 41, 45, 47, 49, 51, 53, 55, 57, 59, 63, 65, 69, 71, 73, 75, 77, 85, 90, 107

Chapter 9: 1, 3, 5, 6, 11, 13, 15, 19, 21, 23, 25, 27, 29, 31, 37, 39, 41, 43, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 89, 92, 94, 101, 110

Chapter 10: 4, 7, 10, 13, 21, 23, 27, 29, 31, 33, 37, 41, 43, 47, 49, 51, 53, 57, 59, 61, 63, 65, 67, 71, 75, 77, 79, 83, 85, 93, 95, 101, 108, 111, 123

Chapter 11: 1, 5, 6, 7, 11, 15, 17, 19, 21, 23, 25, 27, 29, 33, 35, 39, 41, 45, 47, 51, 53, 55, 57, 59, 61, 63, 73, 77, 82, 90

Topical Outline & Course Calendar

Week	Day	Topic
1	M 1/13	Course introduction, 1. Chemistry & Matter
	W 1/15	1. Properties & Measurement
	F 1/17	1. Significant figures & Dimensional analysis
2	M 1/20	Martin Luther King, Jr. Day NO CLASS
	W 1/22	2. Atoms & Elements: Structure & Properties
	F 1/24	2. Molecules: Structure & Naming
3	M 1/27	2. Ions: Properties & Naming
	W 1/29	3. Chemical Reactions & Equations
	F 1/31	3. Formula Mass & Moles
4	M 2/3	3. Molecular formulae
	W 2/5	3. Formulae, Stoichiometry & Reaction yields
	F 2/7	4. Aqueous solutions & Precipitation
5	M 2/10	4. Acids, Bases & Neutralization
	W 2/12	4. Redox Reactions
	F 2/14	EXAM 1 (Chapters 1-3)
6	M 2/17	4. Concentration, Stoichiometry & Chemical analysis
	W 2/19	5. Energy & Thermodynamics
	F 2/21	5. Enthalpy & Calorimetry
7	M 2/24	5. Enthalpy & Calorimetry cont.
	W 2/26	5. Hess Law & Formation Enthalpies
	F 2/28	6. Photons, Atoms & Bohr model
8	M 3/3	Spring Break NO CLASS
	W 3/5	Spring Break NO CLASS
	F 3/7	Spring Break NO CLASS
9	M 3/10	6. Uncertainty, Quantum mechanics, & Atomic orbitals
	W 3/12	6. Electron configurations & Periodic table
	F 3/14	7. Periodic Properties: Nuclear charge & Atomic size
10	M 3/17	7. Periodic Properties: Ionization energy & Electron affinities
	W 3/19	7. Metals, Metalloids, Non-metals & Periodic groups
	F 3/21	EXAM 2 (Chapters 4-6)
11	M 3/24	8. Octet rule & Ions
	W 3/26	8. Covalent bonding, Polar bonds & Enthalpy
	F 3/28	8. Lewis structures, Formal charge, & Resonance
12	M 3/31	9. Molecular shapes & VSEPR model
	W 4/2	9. Molecular shape and polarity & Orbital hybridization
	F 4/4	9. Resonance & Molecular orbital (MO) theory
13	M 4/7	10. Gases, Pressure, & Gas laws
	W 4/9	10. Ideal gas law & Mixtures and partial pressure
	F 4/11	EXAM 3 (Chapters 7-9)
14	M 4/14	10. Kinetic and molecular nature of gases & Real gases
	W 4/16	11. Phases of matter & Intermolecular forces
	F 4/18	Easter Break NO CLASS
15	M 4/21	Easter Break NO CLASS
	W 4/23	11. Intermolecular forces & Properties of liquids,
	F 4/25	11. Phase changes, Vapor pressure, and Phase diagrams

Note: The instructor reserves the right to change the course calendar as needed.