GENERAL CHEMISTRY FOR ENGINEERS
CHEMISTRY 171 SECTION 1
FALL 2018

Instructor: Dr. M. Paul Chiarelli, 102 Flanner Hall, 508-3106
         E-mail: mchiare@luc.edu

Office Hours: 9:30 to 11:30 AM Monday and 2-4 PM Wednesday.

Purpose of Course: To acquaint students with fundamental concepts of chemistry and their application in engineering science.

Textbooks: "Chemistry for Engineering Students", 3rd edit. by Larry Brown and Tom Holme (Cengage Learning, Inc.) ISBN 978-1-285-19902-3 is required. The Student Solutions Manual with Study Guide, ISBN 978-1-285-84524-1 is recommended.

Lecture Notes: Lecture notes/Handouts for each chapter will be made available electronically. Students are expected to "fill in the blanks" (take notes) with calculations, chemical equations, and structures in the handouts as the lectures proceed. When set of notes is completed for a Chapter, a completed version will be posted in Sakai.

Other Materials: You will need an inexpensive calculator having logarithmic (base 10 and base e), exponential, and trigonometric functions. Be sure you are familiar with your calculator and that it is in user-ready condition for quizzes and exams. **Calculators cannot be shared during exams and the covers must be removed while taking the exam. You are not allowed to have a cell phone during the exam.**

Class Procedures: All sections of this class will meet for lecture on Monday, Wednesday, and Friday from 8:15 to 9:05 AM in Dumbach Hall 227. Discussion sections will be held from 9:20 AM to 10:10 AM on Wednesday in Dumbach 227. A discussion worksheet will be provided at the beginning of each discussion period. The instructor will demonstrate the first problem or a selected problem on the worksheet for the class. Then you will be expected to complete the worksheet problems (you may work together) and hand them in at the end of the session. These will not be graded.   Students may work in groups and need not hand in perfect worksheets but must make a good faith effort to complete the assignment to get full credit. Completed discussion sheets will be posted on Sakai prior to the upcoming exam.

Homework Problems: Students who expect to do well on the quizzes and exams should be able to the assigned problems at the end of the chapters in the book. Representative problems will be demonstrated in lecture and worked out in the discussion sections. Students who expect to do well must understand the concepts behind the problems. Students who can do the indicated problems at the end of the chapters should have no problem with the tests.

Exams, Discussion Assignments, and Grading: The total grade for the course is based on five 1-hour exams given over the course of the semester, discussions, and one final. Your lowest 1-hour exam score will be dropped. If you have to miss an exam due to illness or some other reason, this will be your dropped grade. If you miss another exam, then you must have a valid excuse (doctor's note) to have a make-up exam arranged. Each of the five hour exams is worth 17% of your grade (best four is 68% of total). The final is worth 22% of your total grade. Discussions are 10% of your total grade.

Grading Scale: The following scale will be used to determine letter grades **A** 100-93; **A-** 92-89; **B+** 88-85; **B** 84-81; **B-** 80-77; **C+** 76-73; **C** 72-69; **C-** 68-65; **D** 64-53; **F** <52.

Exams and Academic Honesty: Students are expected to present their IDs upon taking exams and quizzes. Academic dishonesty of any sort will not be tolerated. Students caught cheating on an exam or who have someone else take it for them will receive an F grade for the course.

Laboratory: General Chemistry laboratory, Chem 173 (section 02) should be taken concurrently with this course.

Course Repeat Rule: Effective with the Fall 2017 semester, students are allowed only THREE attempts to pass Chemistry courses with a C- or better grade. The three attempts include withdrawals (W).

TENTATIVE CLASS SCHEDULE

Date	Day	Topic	Chapter
8/27	M	Introduction, Atoms and Molecules	1,2
8/29	W	Atoms and Molecules	
8/31	F	Balancing Chemical Equations	2
9/3	M	Labor Day, no class	
9/5	W	Chemical Bonds	2
9/5	W	Discussion I: Balancing Equations	2,3
9/7	F	Limiting reagent, Ions in Solution	3
9/10	M	Ions in Solution	3
9/12	W	Reactions in Solution	3

9/12	W	Discussion II: Mole-Mass and Volumetric Calculations	3
9/14	F	Exam 1 Chapters 2 and 3	
9/17	M	Reaction Stoichiometry	4
9/19	W	Reaction Stoichiometry	4
9/19	W	Discussion III: Reaction Stoichiometry	4
9/21	F	Ideal Gas Law	5
9/24	M	Kinetic Theory and non-Ideal Gases	5
9/26	W	Gas Law Calculations	5
9/26	W	Discussion IV: Gas Law Calculations	4,5
9/28	F	Exam II Chapters 4 and 5	
10/1	M	Electron Configurations of Atoms	6
10/3	W	Electron Configurations of Atoms	6
10/3	W	Discussion V:Electron Configurations	6
10/5	F	Periodic Trends in Atomic Properties	6
10/8	M	Midsemester Break	
10/10	W	Ionic, Covalent bonds and Lewis Structures	7
10/12	F	Hybrid orbitals and Molecular shapes	7
10/15	M	Drawing Lewis Structures	7
10/17	W	Exam 3: Chapters 6 and 7	
10/19	F	Molecules and Materials	8
10/22	M	Molecules and Materials	8

Date	Day	Topic	Chapter
10/24	W	First Law of Thermodynamics	9
10/24	W	Discussion VI: Molecules and Materials	8
10/26	F	Hess's Law	9
10/29	M	Calorimetry	9
10/31	W	Calorimetry	9
10/31	W	Discussion VII: Calorimetry and Hess's Law Calculations	9
11/2	F	Exam 4: Chapters 8 and 9	
11/5	M	Spontaneous Chemical Reactions and Entropy	10
11/6	W	Second Law of Thermodynamics	
11/6	W	Discussion VIII: Spontaneous Reactions	10
11/9	F	Gibbs free energy and Chemical Reactions, Rate Laws	10,11
11/12	M	Rate Laws of Chemical Reactions	11
11/14	W	Temperature, Reaction Rates, and Catalysis	11
11/14	W	Discussion IX: ΔG and Chemical Kinetics	10,11
11/16	F	Exam 5: Chapters 10 and 11	
11/19	M	Chemical Equilibrium, LêChatlier's principle	12
11/21	W	Thanksgiving Break	
11/23	F	Thanksgiving Break	
11/26	M	Chemical Equilibrium and Equilibrium Constants; LêChatlier's principle	12

11/28	W	Acid-Base Equilibria	12
11/28	W	Discussion X: Chemical Equilibrium	12
11/30	F	Acid-Base and Solubility Equilibria	12
12/3	M	Redox Reactions and Galvanic Cells	13
12/5	W	Nernst Equation	13
12/5	W	Discussion XI: Balancing Redox equations	
12/7	F	Corrosion, Batteries, and Electrolysis	13
12/13	Th	Final Exam 9-11 AM	