

Chemistry 105

General Chemistry for Majors

Section 001

Instructor: Dr. A. W. Herlinger, 418 Flanner Hall, (773) 508-3127, **email:** aherlin@luc.edu.

Office Hours: Tu, Th 2:30 – 4:00 PM, other times by appointment.

Required Textbooks: **Chemistry, The Central Science**, T. L. Brown, H. G. LeMay, B. E. Burston, C. J. Murphy, and P. M. Woodward, Prentice Hall, Inc., 12th ed., 2012. ISBN-10: 0321696727 | ISBN-13: 97816967274. Access to Mastering Chemistry is not required.

Slowinski's Chemical Principles in the Laboratory for Chemistry 105: Loyola University Edition, E. J. Slowinski, W. C. Wolsey, and R. C. Rossi, Brooks/Cole, 2011. ISBN-10: 113368825X | ISBN-13: 9781133688259, available at the LUC bookstore.

Recommended Textbook: **Student's Guide, Chemistry, the Central Science**, J. C. Hill, Prentice Hall, Inc., 12th ed., 2012. ISBN-10: 0321704584 | ISBN-13: 9780321704580. This paperback contains numerous additional, detailed, worked-out examples as well as many practice exam questions. This paperback book could be shared to reduce cost.

Lecture: Lectures are scheduled for Tuesday and Thursday at 1:00 – 2:15 PM in Flanner Hall, Room 133. Lecture **outlines** for each chapter will be periodically sent to all enrolled students via Loyola's email system, GroupWise. Written reminder of exam dates and coverage will also be provided via this medium. **Exams will be given as indicated in the schedule of topics.**

Discussion: Discussion, section 002, is scheduled to meet twice a week, i.e., Tuesday and Thursday at 4:00 – 5:00 PM in Flanner Hall, Room 133.

Course Description: A study of chemical principles, reactions, and bonding with emphasis on the development of a scientific attitude and an understanding of fundamental concepts.

Course Objectives: Provide a foundation for advanced work in chemistry and an appreciation for the scientific method with special emphasis on problem solving. Acquire knowledge about the properties and reactions of matter. Gain an understanding of the basic principles of chemistry and its many applications.

Calculators: Only the most **basic scientific calculator** may be used during examinations, e.g., a TI-30XA, TI-34 II, or FX-60. **Cell phones, graphing calculators, and programmable calculators are not allowed to be used during examinations.**

Laboratory: Chemistry 105 has a laboratory component, sections 003 & 004, which meet in FH-305 and 308 on Wednesdays at 11:30 – 2:30 and 2:45 – 5:45 PM, respectively. Laboratory work will begin on 9/5/12.

Tentative Lecture Schedule

<i>Date</i>	<i>Day</i>	<i>Topics</i>	<i>Chapter</i>	<i>Pages</i>
8/28	T	Matter Discussion	1	2 – 14; xxix-xxx
8/30	Th	Measurements Discussion	1	15 – 31, 1051 – 1057
9/4	T	Atomic Theory of Matter Discussion	2	38 – 51
9/6	Th	Molecules & Ions Discussion (Seminar, 5 points) – Life Sciences 142	2	52 – 68
9/11	T	Chemical Equations Discussion	3 A	76 – 85
9/13	Th	Stoichiometry (Mole Relations) Discussion – Exam I – Ch 1, 2, & 3 A	3 B	86 – 104
9/18	T	Aqueous Reactions Discussion	4	114 – 138
9/20	Th	Solution Stoichiometry Discussion	4	139 – 149
9/25	T	Thermochemistry Discussion	5	158 – 174
9/27	Th	Calorimetry Discussion	5	175 – 180
10/2	T	Hess's Law Discussion	5	181 – 195
10/4	Th	Atomic Spectra Discussion – Exam II – Ch 3 B, 4, & 5	6	206 – 218
10/9	T	Mid-Semester Break – No Classes		

10/11	Th	Quantum Mechanical Model Discussion	6	219 – 232
10/16	T	Electron Configurations Discussion	6	233 – 239
10/18	Th	Periodic Properties Discussion	7 A	248 – 268
10/25	Th	Group Trends Discussion – Exam III – Ch 6 & 7 A	7 B	269 – 279
10/30	T	Basic Chemical Bonding Discussion	8	288 – 304
11/1	Th	Lewis Structures Discussion	8	305 – 314
11/6	T	Covalent Bond Strength Discussion	8	315 – 322
11/8	Th	Molecular Geometry Discussion – Exam IV – Ch 7 B & 8	9	330– 344
11/13	T	Orbital Overlap & Hybrid Orbitals Discussion	9	345 – 357
11/15	Th	Molecular Orbitals Discussion	9	358 – 373
11/20	T	Gas Laws Discussion	10 A	382 – 390
11/22	Th	Thanksgiving Break – No Classes		
11/27	T	The Ideal-Gas Equation Discussion	10 A	391 – 401
11/29	Th	Exam V – Ch 9 & 10 A		

12/4	T	Kinetic Theory & Real Gases Discussion	10 B	402 – 415
12/6	Th	Intermolecular Forces Discussion – Laboratory Final Exam	11	424 – 438
12/13	Th	Final Exam (1:00 – 3:00 PM) – Chapters 1 – 11		

End-of-Chapter Problems: Students who are making good progress in the course should be able to solve, independently, most or all of the end-of-chapter problems. The exemplary problems listed below should be attempt before attending discussion. Solutions to selected problems will be presented during discussion.

Selected End-of-Chapter Problems:

Chapter 1: 4, 6, 7, 9, 13, 19, 21, 25, 31, 33, 37, 39, 41, 49, 55, 59, 69, 71, 72, 78

Chapter 2: 4, 9, 13, 15, 17, 21, 23, 29, 31, 39, 43, 47, 55, 61, 65, 69, 73, 87, 92, 94, 101

Chapter 3: 3, 7, 9, 11, 19, 25, 31, 39, 43, 49, 57, 59, 65, 69, 73, 79, 83, 89, 94, 101

Chapter 4: 2, 7, 13, 25, 31, 39, 43, 45, 49, 51, 59, 69, 75, 77, 85, 96, 99, 103, 114

Chapter 5: 5, 11, 13, 21, 27, 31, 35, 45, 49, 51, 53, 59, 63, 69, 73, 79, 87, 91, 97, 114

Chapter 6: 6, 8, 15, 17, 24, 29, 31, 35, 41, 43, 47, 49, 53, 57, 61, 63, 65, 69, 75, 90

Chapter 7: 2, 5, 15, 17, 21, 29, 31, 33, 39, 41, 43, 51, 53, 57, 65, 67, 73, 83, 93, 106

Chapter 8: 2, 7, 9, 15, 19, 23, 31, 35, 37, 41, 47, 51, 55, 59, 63, 65, 71, 80, 87, 90

Chapter 9: 3, 5, 9, 11, 25, 31, 34, 39, 43, 45, 47, 49, 53, 61, 63, 65, 67, 73, 96, 114

Chapter 10: 2, 5, 19, 25, 31, 37, 41, 45, 55, 59, 61, 71, 73, 75, 71, 77, 83, 91, 97, 95, 109

Chapter 11: 5, 7, 9, 11, 15, 19, 21, 33

Examinations and Academic Honesty: Course grades will be determined from scores achieved on examinations and laboratory work. Examinations are cumulative and may include material that has appeared on previous exams. **Five points will be deducted from your exam score if the answer sheet is turned in after the exam has ended and/or your name and identification number are not properly filled in.**

DEPARTMENT POLICY ON ACADEMIC INTEGRITY: 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. You can view this document online 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, lab report) must represent your own work. Any students caught cheating will, at the very minimum, receive a grade of “zero” for the item that was submitted **and this grade cannot be dropped**. If the cheating occurred during a course exam, the incident will be reported to the Chemistry Department Chair and the Office of the CAS Dean. Depending on the seriousness of the incident, additional sanctions may be imposed.

Grading Scheme: Course grades are based on the number of points earned on examinations (600), and in the laboratory (150). The number of points acquired, out of a total of 750 achievable points, will be determined in one of two ways depending upon the final exam score. The method giving the highest score will be used.

If your final exam score is higher than your lowest hour exam score, the lowest hour exam will be dropped and the final exam will be weighted twice an hour exam, *i.e.*, Method 1. If your final exam score is lower than your lowest hour exam score, the final exam will be weighted the same as an hour exam and all hour exams will be used in calculating your point total, *i.e.*, Method 2.

Article	Method 1	Method 2
Exam 1	100	100
Exam 2	100	100
Exam 3	-	100
Exam 4	100	100
Exam 5	100	100
Final	200	100
Lab	<u>150</u>	<u>150</u>
Total	750	750

Make-up work will not be given for missed exams or lab work. Proportionate scores will be used in cases of excused absences. If one hour exam is missed, Method 1 will be employed dropping the missed hour exam from the calculation. If a second hour exam is missed, an excused absence may be given at the discretion of the lecturer. An excused absence will be given only in case of an extreme family crisis or serious illness. **This must be verified by a letter** from a parent or an attending physician no later than four calendar days after the date of the absence. A grade of “F” will be assigned if three or more exams are missed.

Grading Scale: The following scale will be used to determine letter grades, **A** 100-86; **B** 85-74; **C** 73-62; **D** 61-50; **F** < 50. Plus and minus grades are assigned proportionately within these ranges. Grading contributions are 80% from test articles and 20% from laboratory work.