

**Chemistry 102 - Section 012**  
**General Chemistry**  
**Spring 2014**

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

**Office Hours:** Tu, Th 10:00 – 11:00 AM, 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., 12<sup>th</sup> ed., 2012. ISBN-10: 0321696727 | ISBN-13: 97816967274. Access to Mastering Chemistry is not required.

**Recommended Textbook:** **Student's Guide, Chemistry, the Central Science**, J. C. Hill, Prentice Hall, Inc., 12<sup>th</sup> 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 may be shared to reduce cost.

**Lecture and Discussion:** Lecture is scheduled Tuesday and Thursday at 8:30 – 9:45 AM in Flanner Hall, Room 133. Discussion is scheduled for Tuesday at 11:30 – 12:45 AM in Flanner Hall, Room 133. **Lecture outlines** for selected chapters will be sent periodically to all enrolled students via Loyola's email system, **Outlook**. Written reminder of exam dates and coverage will also be provided via this medium. Examinations will be given as indicated in the schedule of topics.

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

**Course Objectives:** Provide a foundation in chemistry with special emphasis on problem solving. Acquire knowledge about the phases and reactions of matter. Gain an understanding of solution properties, chemical kinetics, thermodynamics, chemical equilibrium, electrochemistry, and radiochemistry.

**Calculators:** Only the most **basic scientific calculator** may be used during examinations, e.g., a TI-30XA or other ACT/SAT allowed calculator. Cell phones, graphing calculators, and programmable calculators are not permitted to be present during examinations. **Twenty points will be deducted from your exam score if a cell phone, graphing calculator, or programmable calculator is present during an examination.**

**Examinations:** Course grades will be determined from the scores achieved on examinations. Examinations are cumulative and may include material that has appeared on previously. **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/identification number are not properly filled in.**

## Tentative Schedule of Topics

<i>Date</i>	<i>Day</i>	<i>Topics</i>	<i>Chapter</i>	<i>Pages</i>
<b>1/14</b>	<b>T</b>	Solutions	13	512 – 525; 431 – 434
<b>1/16</b>	<b>Th</b>	Concentration Terms	13	526 – 529
<b>1/21</b>	<b>T</b>	Colligative Properties	13	530 – 547 445 – 447
<b>1/23</b>	<b>Th</b>	Reaction Rates	14	556 – 568
<b>1/28</b>	<b>T</b>	Rate Dependences	14	569 – 580
<b>1/30</b>	<b>Th</b>	Reaction Mechanisms	14	581 – 597
<b>2/4</b>	<b>T</b>	<b>Examination I</b>		
<b>2/6</b>	<b>Th</b>	Chemical Equilibrium	15	610 – 618
<b>2/11</b>	<b>T</b>	Using Equilibrium Constants	15	619 – 626
<b>2/13</b>	<b>Th</b>	Applications of $K_c$	15	627 – 642
<b>2/18</b>	<b>T</b>	Acids and Bases	16	650 – 665
<b>2/20</b>	<b>Th</b>	Weak Acids and Bases	16	666 – 680
<b>2/25</b>	<b>T</b>	Salt Solutions	16	681 – 688
<b>2/27</b>	<b>Th</b>	<b>Examination II</b>		
<b>3/3–8</b>	<b>M-S</b>	Spring Break – No Classes		
<b>3/11</b>	<b>T</b>	Lewis Acids & Bases	16	689 – 694
<b>3/13</b>	<b>Th</b>	Aqueous Equilibrium – Buffers	17	702 – 713
<b>3/18</b>	<b>T</b>	Acid-Base Titrations	17	714 – 721
<b>3/20</b>	<b>Th</b>	Solubility Equilibrium	17	722 – 740

<b>3/25</b>	<b>T</b>	Chemical Thermodynamics	19	784 – 889
<b>3/27</b>	<b>Th</b>	<b>Examination III</b>		
<b>4/1</b>	<b>T</b>	Entropy & the Second Law	19	790 – 802
<b>4/3</b>	<b>Th</b>	Gibbs Free Energy	19	803 – 817
<b>4/8</b>	<b>T</b>	Electrochemistry	20	826 – 834
<b>4/10</b>	<b>Th</b>	Voltaic Cells – EMF	20	835 – 853
<b>4/15</b>	<b>T</b>	Batteries & Electrolysis	20	854 – 865
<b>4/17</b>	<b>Th</b>	<b>Examination IV</b>		
<b>4/22</b>	<b>T</b>	Nuclear Reactions	21	894 – 909
<b>4/24</b>	<b>Th</b>	Radioactivity	21	874 – 893
<b>5/3</b>	<b>S</b>	<b>Final Exam (9:00 – 11:00 PM)</b>		

**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, but are not to be submitted for grading. Solutions to selected problems will be presented during discussion.

**End-of-Chapter Problems:**

**Chapter 13:** 1, 5, 9, 13, 15, 23, 27, 35, 39, 45, 57, 59, 67, 69, 73, 79, 85, 103

**Chapter 14:** 2, 5, 6, 7, 13, 19, 23, 33, 39, 49, 63, 65, 73, 77, 81, 85, 101, 112

**Chapter 15:** 1, 4, 11, 21, 25, 31, 34, 39, 45, 47, 51, 55, 61, 80, 83, 87, 91, 97

**Chapter 16:** 1, 6, 11, 13, 17, 23, 29, 35, 37, 41, 45, 51, 53, 67, 73, 75, 79, 83, 85, 87, 89, 97, 99, 122

**Chapter 17:** 1, 4, 7, 9, 13, 15, 17, 19, 25, 27, 29, 33, 41, 43, 45, 51, 53, 61, 63, 67, 69, 79, 84, 85, 106

**Chapter 19:** 1, 5, 11, 15, 21, 23, 29, 37, 41, 47, 51, 53, 57, 67, 71, 77, 75, 79, 85, 98

**Chapter 20:** 1, 2, 13, 15, 17, 21, 25, 31, 33, 37, 43, 45, 51, 53, 57, 67, 89, 91

**Chapter 21:** 1, 4, 11, 15, 19, 21, 25, 27, 31, 33, 41, 43, 47, 51, 55, 59, 69

**Grading Scheme:** Grades will be based on the total number of points earned out of 500 possible achievable points. Your point total will be determined in one of two ways depending upon your Final Exam score. The method giving the highest total number of points will be used.

Method 1: 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.

Method 2: 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 exam scores will be used in calculating your point total.

Test Article	Method 1	Method 2
Exam I	<b>100</b>	<b>100</b>
Exam II	<b>100</b>	<b>100</b>
Exam III	-	<b>100</b>
Exam IV	<b>100</b>	<b>100</b>
Final Exam	<b><u>200</u></b>	<b><u>100</u></b>
Total	<b>500</b>	<b>500</b>

Make-up work will not be given for missed examinations. If an hour exam is missed for any reason, Method 1 will be employed dropping the missed hour exam from the calculation. If a second hour exam is missed, an excused absence will 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, which must be verified by a **letter** from a parent or an attending physician no later than **four** calendar days after the scheduled exam date. A proportionate exam score will be used in the case of an excused absence. A grade of “F” will be assigned if three 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 100% from test articles.

**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](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.