

**Chemistry 102 - Section 018**  
**General Chemistry**  
**Spring 2013**

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

**Office Hours:** Tu, Th 3:00 – 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., 12<sup>th</sup> ed., 2012. ISBN-10: 0321696727 | SBN-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:** Lectures are scheduled for Tuesday and Thursday at 6:00 – 7:45 PM in Flanner Hall, Room 133. Lecture **outlines** for selected chapters 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 and quizzes 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, radiochemistry, and coordination chemistry.

**Calculators:** Only the most **basic scientific calculator** may be used during examinations, e.g., a TI-30XA, TI-34 II, or any ACT/SAT allowed calculator. Cell phones, graphing calculators, and programmable calculators are not permitted to be used during examinations. **Ten points will be deducted from your exam score if a cell phone, graphing calculator, or programmable calculator is present during an examination.**

**Examinations and Quizzes:** Course grades will be determined from scores achieved on examinations and quizzes. 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 or 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>1/15</b>  | <b>T</b>   | Solutions                            | 13             | 512 – 525;<br>431 – 434 |
| <b>1/17</b>  | <b>Th</b>  | Concentration Terms                  | 13             | 526 – 528               |
| <b>1/22</b>  | <b>T</b>   | Colligative Properties               | 13             | 530 – 547<br>445 – 447  |
| <b>1/24</b>  | <b>Th</b>  | Reaction Rates                       | 14             | 556 – 568               |
| <b>1/29</b>  | <b>T</b>   | <b>Quiz 1</b> , Rate Dependences     | 14             | 569 – 580               |
| <b>1/31</b>  | <b>Th</b>  | Reaction Mechanisms                  | 14             | 581 – 597               |
| <b>2/5</b>   | <b>T</b>   | Chemical Equilibrium                 | 15             | 610 – 626               |
| <b>2/7</b>   | <b>Th</b>  | Equilibrium Constants                | 15             | 627 – 642               |
| <b>2/12</b>  | <b>T</b>   | Acids & Bases                        | 16             | 650 – 665               |
| <b>2/14</b>  | <b>Th</b>  | <b>Examination I</b>                 |                |                         |
| <b>2/19</b>  | <b>T</b>   | Weak Acids & Bases                   | 16             | 666 – 688               |
| <b>2/21</b>  | <b>Th</b>  | Lewis Acids & Bases                  | 16             | 689 – 694               |
| <b>2/26</b>  | <b>T</b>   | Aqueous Equilibrium – Buffers        | 17             | 702 – 713               |
| <b>2/28</b>  | <b>Th</b>  | <b>Quiz 2</b> , Acid-Base Titrations | 17             | 714 – 721               |
| <b>3/4–9</b> | <b>M-S</b> | Spring Break – No Classes            |                |                         |
| <b>3/12</b>  | <b>T</b>   | Solubility Equilibrium               | 17             | 722 – 740               |
| <b>3/14</b>  | <b>Th</b>  | The Second Law                       | 19             | 784 – 892               |
| <b>3/19</b>  | <b>T</b>   | Entropy                              | 19             | 793 – 802               |
| <b>3/26</b>  | <b>T</b>   | <b>Examination II</b>                |                |                         |

|             |           |                                    |    |           |
|-------------|-----------|------------------------------------|----|-----------|
| <b>3/28</b> | <b>Th</b> | Easter Break – No Classes          |    |           |
| <b>4/2</b>  | <b>T</b>  | Electrochemistry                   | 20 | 826 – 834 |
| <b>4/4</b>  | <b>Th</b> | Voltaic Cells – EMF                | 20 | 835 – 853 |
| <b>4/9</b>  | <b>T</b>  | Batteries & Electrolysis           | 20 | 854 – 865 |
| <b>4/11</b> | <b>Th</b> | Radioactivity                      | 21 | 874 – 893 |
| <b>4/16</b> | <b>Th</b> | Nuclear Reactions                  | 21 | 894 – 909 |
| <b>4/18</b> | <b>Th</b> | <b>Examination III</b>             |    |           |
| <b>4/23</b> | <b>T</b>  | Coordination Compounds             | 23 | 962 – 978 |
| <b>4/25</b> | <b>Th</b> | Crystal Field Theory               | 23 | 979 – 996 |
| <b>4/30</b> | <b>T</b>  | <b>Final Exam (6:00 – 8:00 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 should not 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

**Chapter 23:** 2, 5, 7, 23, 25, 29, 31, 37, 39, 41, 49, 53, 63, 65, 67, 78, 82, 97

**Grading Scheme:** Test contributions will be based on the total number of points earned out of 450 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 exams will be used in calculating your score.

| Test Article | Method 1          | Method 2          |
|--------------|-------------------|-------------------|
| Exam 1       | <b>100</b>        | <b>100</b>        |
| Exam 2       | <b>100</b>        | <b>100</b>        |
| Exam 3       | -                 | <b>100</b>        |
| 2 Quizzes    | <b>50</b>         | <b>100</b>        |
| Final        | <b><u>200</u></b> | <b><u>100</u></b> |
| Total        | <b>450</b>        | <b>450</b>        |

Make-up work will not be given for missed exams or quizzes. Proportionate scores will be used in cases of excused absences for quizzes. If an 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 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 date of the exam. A grade of “F” will be assigned if three exams and/or quizzes 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.