Course Information
Analytical Chemistry
CHM 2300
Fall 2017
Credit Hour: 3
Course Format: Traditional
Boston Main Campus
Meeting Days/Times: Mondays, 5:50 – 8:20pm

Instructor Information
Patricia Brandl, PhD
p.brandl@northeastern.edu
Office/Virtual Hours: Email me to schedule an appointment. Instructor response time will be 24-48 hours.

Course Description
Introduces the principles and practices in the field of analytical chemistry. Focuses on development of a quantitative understanding of homogeneous and heterogeneous equilibria phenomena as applied to acid-base and complexometric titrations, rudimentary separations, optical spectroscopy, electrochemistry, and statistics.

Course Prerequisite: CHM1200 and CHM1201, Co-requisite: CHM 2301

Course Materials

Student Learning Outcomes
The goal of this course is to introduce students to analytical chemistry. Following completion of the course students should be able to:
- Describe the fundamentals of error and the meaning of measurement
- Describe the role of equilibrium in chemical analysis
- Describe the interaction of molecules and ions with energy
- Describe the fundamental types of analytical separations and explain their limitations
- Demonstrate achievement of chemical literacy through problem-solving and conceptual understanding
Expectations

- **Workload**: For a three-credit course, students should expect 2.5 hours a week of classroom or faculty instruction and a minimum of 5 hours of out of class student work for a 15-week course.
- **Attendance policy**: You are responsible for any material covered in class. The exam dates are given near the end of this document and will not change. The due date for the research project presentation is also given at the end of this document and will not change. You must attend the exams and the research project presentation.
- **Policy on missed exams**: The exams will be held on the dates noted in the course schedule on the last page of this document. Exams are cancelled only due to adverse weather (university is closed.)
- **If you are absent for either exam one or exam two for any reason, documentation must be provided (doctor’s note or similar.) Provided that such documentation is provided, an additional set of problems will be added to the final exam. These problems will concern material that appeared on the missed exam. The grade received for these problems will be used as the grade for the missed exam.
- **There is no makeup for a missed final exam.**
- **Policy on late/incomplete work**: The research project is due on the date given in the class schedule. As presentations will be will held on this date, no late projects will be accepted. You are encouraged to submit the research project early.
- **Communication with instructor**: Please contact via email.

Grading/Evaluation Standards

**Exams**: Exams are primarily problem-based. A study guide for each exam will be made available just after the class prior to the exam. The study guide will include the topics included in the exam, as well as a list of the mathematical formulas for which you will be responsible. In addition, a list of the provided reference materials (ex. Periodic table) will be given.

**Research Project (paper)**: The research paper must be based upon an article from the journal Analytical Chemistry (published by the American Chemical Society.) The article must be date 2012 or later and must be approved by the instructor. Your submission must be 4 pages long, exclusive of diagrams/figures or a title page. (Submissions of longer than 4 pages are allowed.) It must utilize a minimum of 3 sources, none of which may be Wikipedia or similar. Margins should be 1” on all sides and the font should be 12. The research paper must be submitted in paper (non-electronic) form and must include a paper copy of the article from Analytical Chemistry.

**Research Project (presentation)**: Your presentation should be a minimum of 5 minutes in length. The media you use (PowerPoint or similar) should include at least 4 of the figures/diagrams from your Analytical Chemistry article. Please be prepared to answer questions on your presentation.
PERCENT | GRADE
---|---
93 – 100 | A
90 - 92 | A-
88 - 89 | B+
83 - 87 | B
80 - 82 | B-
78 - 79 | C+
73 - 77 | C
70 - 72 | C-
68 - 69 | D+
63 - 67 | D
60 - 62 | D-
Less than 60 | F

**Grade Breakdown:**
- Exam 1: 20%
- Exam 2: 20%
- Final Exam: 30% (Final exam is cumulative.)
- Research project paper: 20%
- Research project presentation: 10%

**Tentative Course Schedule (Topics covered may vary; Exam dates are firm)**

<table>
<thead>
<tr>
<th>#</th>
<th>Date</th>
<th>Topic</th>
<th>Reading</th>
<th>Assignment Due</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Sept. 11</td>
<td>Introduction to Analytical Chemistry Measurement and Error</td>
<td>Ch. 0, 1, 3</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Sept. 18</td>
<td>Introduction to Statistics Research Project Overview</td>
<td>Ch. 4, 5</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Sept. 25</td>
<td>Chemical Equilibrium Titration</td>
<td>Ch. 6, 7</td>
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<tr>
<td>4</td>
<td>Oct. 2</td>
<td>Acid-Base Chemistry</td>
<td>Ch. 9, 11</td>
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<tr>
<td>5</td>
<td>Oct. 9</td>
<td>No Class – Columbus Day</td>
<td></td>
<td></td>
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<tr>
<td>6</td>
<td>Oct. 16</td>
<td></td>
<td>Exam 1</td>
<td></td>
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<tr>
<td>7</td>
<td>Oct. 23</td>
<td>Electrochemistry Spectrophotometry</td>
<td>Ch. 14, 18</td>
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<tr>
<td>8</td>
<td>Oct. 30</td>
<td>Atomic Spectroscopy</td>
<td>Ch. 18, 21</td>
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<tr>
<td>9</td>
<td>Nov. 6</td>
<td>Mass Spectrometry Introduction to Separations</td>
<td>Ch. 22, 23</td>
<td></td>
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<tr>
<td>10</td>
<td>Nov. 13</td>
<td>Gas and Liquid Chromatography</td>
<td>Ch. 24, 25</td>
<td></td>
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End-of-Course Evaluation Surveys
Your feedback regarding your educational experience in this class is very important to the College of Professional Studies. Your comments will make a difference in the future planning and presentation of our curriculum.

At the end of this course, please take the time to complete the evaluation survey at https://neu.evaluationkit.com. Your survey responses are completely anonymous and confidential. For courses 6 weeks in length or shorter, surveys will be open one week prior to the end of the courses; for courses greater than 6 weeks in length, surveys will be open for two weeks. An email will be sent to your HuskyMail account notifying you when surveys are available.

Academic Integrity
A commitment to the principles of academic integrity is essential to the mission of Northeastern University. The promotion of independent and original scholarship ensures that students derive the most from their educational experience and their pursuit of knowledge. Academic dishonesty violates the most fundamental values of an intellectual community and undermines the achievements of the entire University.

As members of the academic community, students must become familiar with their rights and responsibilities. In each course, they are responsible for knowing the requirements and restrictions regarding research and writing, examinations of whatever kind, collaborative work, the use of study aids, the appropriateness of assistance, and other issues. Students are responsible for learning the conventions of documentation and acknowledgment of sources in their fields. Northeastern University expects students to complete all examinations, tests, papers, creative projects, and assignments of any kind according to the highest ethical standards, as set forth either explicitly or implicitly in this Code or by the direction of instructors.

Go to http://www.northeastern.edu/osccr/academic-integrity-policy/ to access the full academic integrity policy.

Student Accommodations
The College of Professional Studies is committed to providing equitable access to learning opportunities to students with documented disabilities (e.g. mental health, attentional, learning, chronic health, sensory, or physical). To ensure access to this class, and program, please contact The Disability Resource Center (http://www.northeastern.edu/drc/) to engage in a confidential conversation about the process for requesting reasonable accommodations in the classroom and clinical or lab settings. Accommodations are not provided retroactively so students are encouraged to register with the Disability Resource Center (DRC) as soon as they begin their program. The College of Professional Studies encourages students to access all resources available through the DRC for consistent support.

Library Services
The Northeastern University Library is at the hub of campus intellectual life. Resources include over 900,000 print volumes, 206,500 e-books, and 70,225 electronic journals.
For more information, visit http://library.northeastern.edu/.

**Tutoring Services**
Tutoring can benefit skilled professionals and beginning students alike. NU offers many opportunities for you to enhance your academic work and professional skills through free one-on-one academic support on and off campus. Tutoring is available in multiple subject areas.

For more information, visit http://www.cps.neu.edu/student-resources/tutoring-services.php.

**Northeastern University Online Technical Help (for courses that uses Nu Online)**
Get immediate 24/7 technical support for NU Online by calling 855-836-3520 or visiting the online Support Center. Support via e-mail is also available within one business day at NUOnline@neu.edu.

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The College of Professional Studies Undergraduate Catalog is a reference/resource with information about curricula, resources, and academic and student policies.
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The instructor reserves the right to amend this syllabus, both online and the document itself, during the term and will notify students of the change(s). The revised syllabus is the official record of class policies and schedule of due dates.