Course Syllabus
CH4222 – Bioanalytical Chemistry
College of Science and Arts
Fall 2015

Instructor Information
Instructor: Xiaohu Xia, PhD, Assistant Professor of Chemistry
Office Location: 402C, Chemical Sciences Building
Telephone: 906-487-2470
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Office Hours: TR 11:00 am – noon or by appointment

Graduate Teaching Assistants
Instructors: Simeon Schum & Haihang Ye
Office Locations: Simeon in 618 and Haihang in 713 both in the Chemical Sciences Building
Email: skschum@mtu.edu, haihangy@mtu.edu
Office Hours: TBA and By Appointment

Course Identification
Course Number: CH4222-0A and CH4222-L01 or CH4222-L02
Course Name: Bioanalytical Chemistry
Lecture Location: Room 106, Chemical Sciences Building
Class Times: MWF 12:05pm – 12:55pm
Laboratory Location: 708 and 408 (TBA) Chemical Sciences Building
Laboratory Times: 3:00 pm - 6:00 pm or 7:00 pm - 10:00 pm

Course Description/Overview
This course provides an overview of modern analytical and instrumental techniques with an emphasis on the approaches relevant to common techniques for biochemistry. Topics include: statistical treatment of data; advanced equilibrium; di- and poly-protic acids & bases; theory and methods of spectrophotometry, mass spectrometry, and chromatographic separations; and introduction of modern nanotechnology in bioanalytical chemistry.

Course Learning Objectives
- Describe the fundamentals of quantitative and instrumental analysis
- Assess the uncertainty in an analytical measurement
- Determine the equilibrium concentrations of polyprotic species
• Describe and demonstrate the use of common analytical apparati and methodologies used in modern chemical analysis
• Understand general methods for synthesizing and characterizing nanomaterials
• Develop an ability to work effectively with a team while also being able to learn and work independently
• Acquire attitudes in scientific fields: integrity, creativity, originality, accuracy, and open-mindedness.

Course Resources

Course Website
• Canvas http://www.courses.mtu.edu

Required Course Textbook

Suggested Course Textbooks and Materials
• Nano Letters Journal <http://pubs.acs.org/journal/nalefd>
• CrystEngComm <http://pubs.rsc.org/en/journals/journalissues/ce>

Course Supplies
• Bound laboratory notebook with carbonless copies
• Safety glasses
• Scientific calculator
• Computer with MS Excel
• Lab coat (recommended)

Course Schedule

A full course schedule is provided via Canvas (https://mtu.instructure.com). A major effort has been made to utilize Canvas. The course is organized into weekly modules. The modules include the weekly homework and laboratory assignments, quizzes and supplemental materials. Please contact IT Help via ithelp@mtu.edu or 7---1111 for technical assistance with Canvas.

Homework: Weekly assignments will be posted on Canvas Friday night of each week and will be due on the coming Monday at 11:59 pm (midnight).

Quizzes: Laboratory quizzes will be administered via Canvas.

Laboratory Experiments: Post-lab assignments will be due for each of the laboratory experiments at 11:59 pm (midnight) as scheduled. All short and formal lab reports must be turned in via Canvas as a “.pdf” file.

Exams: 3 Midterm Exams will be given. No final exam will be given.
• Midterm Exam 1: Monday October 12, 2015 at 12 pm (1 hour)
• Midterm Exam 2: Friday November 6, 2015 at 12 pm (1 hour)
• Midterm Exam 3: Friday December 11, 2015 at 12 pm (1 hour)

**Grading Scheme**

**Grading Policy**
Grades will be based on the following:

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Midterm Exams</td>
<td>3 x 100pts = 300</td>
</tr>
<tr>
<td>Homework Assignments</td>
<td>10 x 20pts = 200</td>
</tr>
<tr>
<td>Laboratory Quizzes</td>
<td>100</td>
</tr>
<tr>
<td>Laboratory Reports</td>
<td>400</td>
</tr>
<tr>
<td><strong>Total Points</strong></td>
<td><strong>1000</strong></td>
</tr>
</tbody>
</table>

**NO make-up quizzes/exams will be given.** No make-up exams or quizzes will be given for unexcused absences. The Office of Student Affairs (OSA) grants official MTU excused absences. If you know that you will have an excusable absence on an exam or quiz day, you are required to make arrangements with me as soon as possible for an alternate exam date.

**Homework Assignments:** Homework assignments must be received no later than 48 hours beyond the posted deadline. Late assignments will be given a 25% late penalty. Note, no late homework assignments will be accepted beyond the 48-hour window.

**Attendance Policy:** Class participation, initiative, and attendance will be considered in the final course grade. You must keep up with the material as the semester progresses.

**MTU Grading System**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Course Points</th>
<th>G.P.A.</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>920 – 1000</td>
<td>4.00</td>
<td>Excellent</td>
</tr>
<tr>
<td>AB</td>
<td>880 – 919</td>
<td>3.50</td>
<td>Very good</td>
</tr>
<tr>
<td>B</td>
<td>820 – 879</td>
<td>3.00</td>
<td>Good</td>
</tr>
<tr>
<td>BC</td>
<td>760 – 819</td>
<td>2.50</td>
<td>Above average</td>
</tr>
<tr>
<td>C</td>
<td>700 – 759</td>
<td>2.00</td>
<td>Average</td>
</tr>
<tr>
<td>CD</td>
<td>650 – 699</td>
<td>1.50</td>
<td>Below average</td>
</tr>
<tr>
<td>D</td>
<td>600 – 649</td>
<td>1.00</td>
<td>Inferior</td>
</tr>
<tr>
<td>F</td>
<td>0 – 599</td>
<td>0.00</td>
<td>Failure</td>
</tr>
</tbody>
</table>

**Laboratory Safety**

**Safety glass, closed toe shoes and full-length pants are required.** Many of the chemicals handled in this lab may ruin clothing; therefore a lab coat is highly recommended. Safety glasses must be worn at all times when work is being done by anyone in the lab. Nitrile gloves will be available and should be used when deemed appropriate. Concentrated chemicals (such a concentrated acids/bases) should be handled in the fume hood with heavy weight nitrile gloves and full sealed goggles. All volatile solvents should be handled in the fume hood.
Violation of any of the above rules will be grounds of dismissal for the remainder of the lab period.

**Collaboration/Plagiarism Rules**

Standards of academic conduct are set forth in the MTU Academic Integrity Code (http://www.mtu.edu/deanofstudents/academic-policies/integrity/). When you registered for this course, you acknowledged your awareness of the Academic Integrity Code and you are obliged to become familiar with your rights and responsibilities as defined by this Code. Violations of the Code will result in disciplinary actions. Examples of violations include plagiarism or receiving inappropriate assistance on homework, quizzes, and/or exams.

**Cell phones, Blackberries, iPods, PDAs, or any other electronic devices are not to be used in the classroom.** Students may bring a calculator to class. Calculators on other devices are strictly prohibited. Information exchanges on these devices during class are also prohibited and violate the Academic Integrity Code of Michigan Tech.

**Cheating is a very serious academic offense.** Therefore, allegations of cheating will be referred to the Dean of Student Affairs for appropriate action. Please see me if you have any questions about academic violations as described in the Code or as they relate to particular requirements in this course.

**University Policies**

Student work products (exams, essays, projects, etc.) may be used for purposes of university, program, or course assessment. All work used for assessment purposes will not include any individual student identification.

Michigan Tech has standard policies on academic misconduct and complies with all federal and state laws and regulations regarding discrimination, including the Americans with Disabilities Act of 1990. For more information about reasonable accommodation for or equal access to education or services at Michigan Tech, please call the Dean of Students Office, at (906) 487-2212. For other concerns about discrimination, you may contact your advisor, department head or the Affirmative Action Office, at 487-3310.

**Academic Integrity:**
http://www.studentaffairs.mtu.edu/dean/judicial/policies/academic_integrity.html

**Affirmative Action:**
http://www.admin.mtu.edu/aoa/

**Disability Services:**
http://www.admin.mtu.edu/urel/studenthandbook/student_services.html#disability

**Equal Opportunity Statement:**
http://www.admin.mtu.edu/admin/boc/policy/ch5/ch5p1.htm

# This syllabus is a general plan for the course. Deviations announced to the class by the instructor may be necessary.