CHEM4081 - Principles and Applications of Mass Spectrometry
Fall 2012 Course Syllabus

Instructor: Derek Wilson
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Lectures: Tuesday / Thursday, 2:30 – 4:00, BC 202

Office Hours: After Lecture

Prerequisites: SC/CHEM 3020 3.00 or 4.00; SC/CHEM 3080 4.00

Calendar Description: This course will develop Mass Spectrometry as an analytical tool in chemistry and biochemistry, at an advanced level. The course will be delivered in three sections: instrumentation, theory and applications. Topics will include ionization, mass analyzers, ion dissociation, ion mobility, qualitative and quantitative analysis with various applications, including in the health and medical sciences

Text: None required.

Website: Course material can be accessed through http://www.yorku.ca/dkwilson. All documents pertaining to the course, will be posted.

Marking scheme:
Midterm exam 1 - 25% Oct 18th
Project Assignment - 40% Due: Nov 20th (unofficially Dec 4th)
Final exam - 35%

Grading: The grading scheme for the course conforms to the 9-point grading system used in undergraduate programs at York (e.g. A+=9, A=8, B+=7, B=6, C+=5, C=4, D+=3, D=2, E=1, F=0). A letter grade for the course will be assigned based on the final percentage grade (A+=90-100, A=80-89, B+=75-79, B=70-74, C+=65-69, C=60-64, D+=55-59, D=50-54, E=40-49, F=0-39).

Academic Honesty:
York students are required to maintain high standards of academic integrity and are subject to the **Senate Policy on Academic Honesty**:
(http://www.yorku.ca/secretariat/policies/document.php?document=69)

Students should also review materials on the **Academic Integrity website**:
(http://www.yorku.ca/academicintegrity).

Access/Disability: Students with disabilities, including physical, medical, systemic, learning and psychiatric disabilities may need accommodation in exam requirements.

Students are encouraged to notify the course director and to seek advice from the Counselling and Development Centre. Failure to notify the course director of your needs in a timely manner may jeopardize the opportunity to arrange for academic accommodation.

Notes:
(1) ***E-mail policy.*** All emails must include the name of the sender. It is preferred that your@yorku.ca email address be used. Messages from accounts like bleh@hotmail.com or similar may not receive a reply, probably because the email will be sent to my spam box.

(2) ***Missed exams***. A medical certificate or other valid documentation must be submitted for any midterm exam missed. This documentation must be submitted within 3 working days of the missed exam.

(3) There will be **no make-up for missed midterms**. For a missed midterm (with appropriate documentation) the value of the exam will redistributed among the marks for the assignment and the final exam.

(4) ***Re-grade policy***. If, after graded tests are returned, there is a question concerning the grading of a test, the *entire* test should be returned. The *entire* test may then be re-graded. All requests for re-grading must be made in writing and must be submitted to Dr. Wilson no later than the end of lecture 1 week after the test is returned to the class. The request should identify the question of concern and briefly explain the scientific reason why your answer merits further consideration.

Course Outline

Week 1 (Sept 6th): *History of Mass Spectrometry. Ionization.*

Week 2 (Sept 11th, 13th): *Soft Ionization*

Week 3 (Sept 18th, 20th): *Mass Analyzers: Sector, Quadrupole, Paul Trap*

Week 4 (Sept 25th, 27th): *Collisional Activation, Mass Analyzers: TOF, FT-ICR*

Week 5 (Sept 2nd, Feb 4th): *Mass Analyzers: Orbitrap, MS^n in resonant mass analyzers*

Week 6 (Oct 9th, 11th): *Vacuum Systems, Ion mobility*

Week 7 (Oct 16th, 18th): *Review*, ***Mid-term! (18th)***

Week 8 (Oct 23rd, 25th): *Ion Mobility, Detectors*

Week 9 (Oct 30th): *Applications: Small molecule, Applications: Proteomics*

Co-curricular Day (Nov 1st)

Week 10 (Nov 6th, 8th): *Applications: Protein / Protein Assembly Structure*

Week 11 (Nov 13th, 15nd): *Applications: Protein Dynamics and Function*

Week 12 (Nov 20th, 22nd): *Catchup*

Week 13 (Nov 27th, 29th): Project presentations

Week 14 (Dec 4th): Review