

## Analytical Chemistry – Fall 2018

### CHEM 2080 4.0

Prerequisite: SC/CHEM 1000 3.00 and SC/CHEM 1001 3.00

Three lecture hours and three lab hours per week

Lecture schedule: MW 11:30 – 13:00

Location: SLH A (lecture), CB 343 (laboratory)

Office hour: W 1:30 – 2:30pm, Th 12 – 1pm

Laboratory technician: Carolyn Hempstead (carolynh@yorku.ca)

### Course Director

Jennifer Chen

Office: CB456

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### Course Description:

This course introduces the fundamental principles of analytical chemistry. Concepts on sampling, calibration, experimental uncertainty and statistical data analysis are introduced and applied in laboratory experiments. The principles of solution equilibria including solubility, acid-base, metal-ligand complexation, and redox reactions are fully developed, and titration experiments based on these principles are carried out in the laboratory. An introduction on various analytical techniques including gravimetry, spectrophotometry and potentiometry are presented.

### Course Objectives:

At the end of the course students will have developed more in-depth understanding of chemical equilibria and acquired the skills and knowledge to carry out a variety of analytical chemistry measurements. Students will apply statistical and error analysis to correctly interpret, compare and comment on experimental results.

### Required textbook:

Quantitative Chemical Analysis by D.C. Harris, 8<sup>th</sup> or 9<sup>th</sup> edition (older edition is fine but it is your responsibility to find out the corresponding assigned homework problems).

*Relevant course materials are posted on Moodle.*

### Evaluation:

Two midterms – 30% (15% each)<sup>†</sup>

Activities (iClicker + LON-CAPA assignments) – 10%

Laboratory – 30%

Final exam – 30%<sup>†</sup>

You are required to have a scientific calculator; graphing calculators are not allowed on exams.  
<sup>†</sup>Alternative marking scheme: 10% midterms, 50% final exam (with exceptions noted in course policies).

**\*\*Both lecture and laboratory components must be passed (>50%) independently to pass the course.**

### Tentative Schedule:

Classes: Sept. 5 – Dec. 4

Labs start: Sept. 17

Midterms: Oct. 17, Nov. 14

Thanksgiving and reading week: Oct. 6 - 12

Final exam: Dec. 6 – Dec. 21 (You must stay for the whole exam period in the event of weather-related rescheduling. See University rules.)

**Laboratory Schedule:** Please pick up the lab manual from the lab instructor (CB 360) before Sept. 14. Please consult the schedule found in the laboratory manual for each lab.

**Course policies:**

1. Email etiquette:

- **You must use your YorkU email address and put “Chem 2080” in the subject line.** Emails not conforming to the rules will not receive a response.
- As a courtesy and being respectful to your correspondent, write your email professionally (i.e. text-messaging language is unacceptable). Questions regarding calculations or involving equations should be avoided and are best discussed in person during office hour.

2. Missed exam/lab:

- Documentation of reasons for missing a lab needs to be provided to the lab instructor within 3 business days. The makeup lab, pending on the instructor’s approval, will be scheduled at a time when space and TA are available.
  - NOT all situations will be accommodated for lab make-up. Circumstances not accommodated include, but are not limited to: schedule confusion, conflict with another course, personal endeavours (including a job), busy lives (including too many assignments or tests that same week/day, etc.)
- If you miss one midterm, no documentation is required. The weight of the missed midterm will be added to the final exam. Alternative marking scheme does not apply.
- If you miss both midterms, a documentation (e.g. Attending Physician’s Statement for illness) for the second missed exam is required within 3 business days. When approved, you will be required to write a make-up test for 15% of your mark. Alternative marking scheme does not apply.
- Documentation is required for missed final exam. Deferred standing for final exam is rarely granted and petition to your home faculty will be required. A two-day notice will be given for the makeup final exam. Denied petitions will result in a zero on the final exam. See <http://www.registrar.yorku.ca/petitions/academic/for> information.

3. iClicker REEF and On-line (lon-capa) assignments:

- On-line assignments at [loncapa.sci.yorku.ca](http://loncapa.sci.yorku.ca) are opened at least one week before the due date with the schedule posted on Moodle. Because the marking scheme for Activities already drops the lowest 10% of the mark, no accommodation will be given to missed assignments or iClicker sessions.
- iClicker REEF app can be downloaded for free on your mobile devices and tablets, also available at [app.reef-education.com](http://app.reef-education.com) for laptops. York has free subscription to iClicker REEF, so do not make any purchase even if prompted.
- See iClicker REEF quick start-up guide.
- iClicker marks are gained based on participation and correctness (0.5 each).
- iClicker questions provide you with opportunities to put your learning to practice and gives you feedback on how well you understand course concepts. Using an account not registered to you (or answering iclicker questions for a friend) defeats the purpose of using iClickers and is considered a **breach of Academic Honesty**.
- Occasionally a “location poll” may be conducted to see if you are physically present when participating in iClicker in the lecture.

#### 4. Assignments and lab reports

- **A hard copy of your lab report must be submitted to your TA by the deadline (see lab manual, typically 1 week after the experiment) AND the electronic file must be submitted on Moodle's TurnItIn.** The electronic submission is checked for originality – it will not be marked by your TA.
  - You are encouraged to work with others on lab reports, but this does not mean copying other people's writing, using someone else's spreadsheet, tables or equations as "templates". They constitute as acts of plagiarism.

#### 5. Re-grading of midterm exam:

- If you believe a written answer on a test was marked incorrectly, you must resubmit to me in person detailing your rationale within 5 business days of the return of the exam. **ONLY** those answers written in ink are eligible for re-marking. **NOTE:** re-marking can result in the mark being raised, confirmed, or lowered.

#### 6. Accessibility/Religious accommodations:

- Students registered with Students Accessibility Services must submit the accommodation letters to both me and the Lab instructor by Sept. 17, 2018 and discuss the accommodations with us.
- Any religious observance conflicts occurring at any point during the term should be communicated by Sept. 21, 2018, **especially when it concerns with the lab.** Note that most lab sections are full and while the lab instructor will try to accommodate as much as possible; but sometimes it is difficult to reschedule your lab to your desired time.
- Please note: "Senate policy states that students are expected to monitor their progress in courses, taking into account their personal and academic circumstances, and to make the necessary adjustments to their workload to meet the requirements and deadlines." (from Senate Policy of Students' Responsibilities in the Petition/Appeal Processes). The drop deadline is **Nov. 9, 2018.**

#### 7. Academic Honesty

- **Any student who breaches York's Academic Honesty Policy will be charged.** It will at minimal result in a visit to the Associate Dean's office. Some offences include:
  - Plagiarism (see White Paper - Plagiarism Spectrum on Moodle)
  - Students who misrepresent themselves during iClicker activity, a quiz or examination or provide documentation for absence from any of these that is not legitimate
  - Students who submit any material for remarking that has been modified in any manner to misrepresent the original assessment

#### **Important Information for All Students:**

Students must make themselves aware of university policies on Academic Honesty/Integrity, Access/Disability, Student Conduct, Religious Observance and other matters. A periodically updated Information Sheet summarizing this information can be downloaded\* and printed, and the Registrar's Office issues a list of Religious Observance Days.‡

\* <http://secretariat.info.yorku.ca/files/CourseInformationForStudentsAugust20121.pdf>

‡ <http://registrar.yorku.ca/enrol/dates/religious-accommodation-guidelines-2018-2019>

## ACTIVITIES INFORMATION

### ACTIVITIES GRADE:

- **WORTH:** 10% of your final grade.
- **WHY:** Assignments and clicker-related activities and help you learn because you become aware of where you might be struggling. Analytical chemistry, in particular, requires the *understanding* and *application* of equations and concepts, which are solidified by doing practice problems. Data from previous years also show that students did much better if they attended classes. The activities will also inform me of potential areas of confusion or misconception.
- **WHAT:** Activities include clickers (in-class), and completion of online assignments.
  - **Clicker Questions:** Each clicker question is worth 1 point; points are awarded for *participation and correctness (0.5 each)*. The clicker questions are to help you and thus you should answer them as best you can. Looking to see what your neighbour is choosing doesn't help you at all.
  - **LON-CAPA Assignments:** Each correct answer is awarded 1 point. There are 6 assignments and each one will be due on a specified Sunday at 11:59 pm. The assignments are open at least a week before the due date, and as such, you will have plenty of time and opportunity to complete them. Most questions allow multiple attempts.

**Website:** loncapa.sci.yorku.ca. Log in name is your York email address (XXX@my.yorku.ca) and password is your student ID. Do not use mobile phones as mobile browsers may not be compatible (a known working browser app is Mercury). Extra problems not for credit are also posted.
- **GRADING:** You need to get 90% of the total number of assignment points to get 10% overall mark. Any points you obtain from iClicker count towards the total, effectively lowering the number of points you need from the assignment.

*Example:*  
For a total of 100 lon-capa points, you need to complete  $0.9 \times 100 = 90$  points to get the full 10% if you don't earn any iClicker marks.  
If you participated in iClicker and obtained 10 marks in class, then you will need to obtain 80 points ( $90 - 10 = 80$ ) in lon-capa assignments to get the full 10%.

  - Additional marks will count as bonus up to the maximum of 11% (i.e. 110% in Activities grade).
  - Estimated total points available for iClicker is ~30 (if all correct), and ~90 points in on-line assignment. In other words, iClicker cannot completely substitute the marks of the on-line assignment.

**Using a clicker not registered to you (or answering clicker questions for a friend) is considered a breach of Academic Honesty.**