General information

Course:	CHEM 218
Section:	51
Term:	Winter 2026
Credits:	3.0
Location:	CC-308
Time:	Wed

Instructor:	Prof. Dajana Vuckovic
Department:	Chemistry and Biochemistry
Office:	SP 275.31
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Office hours:	**Mon 5-6 pm**, **Wed 3-4 pm or by appointment**

Preferred means of contact: email – please specify **CHEM 218 in the subject line** and include your student number when emailing me. I will generally answer my email within 1 business day, except on weekends when I do not check my email.

Course Description

Calendar course description: Prerequisite: CHEM 217. Chemical equilibria and titration curves of oxidation-reduction, precipitation, and non-aqueous systems; potentiometry and potentiometric titrations; introduction to spectroscopy with emphasis on molecular and atomic absorption spectroscopy, fluorescence spectroscopy. Lectures and laboratory.

Expanded course description: This course is the second part of an introduction to "classical" methods of analysis that rely heavily on equilibria such as precipitation, redox and potentiometric titrations. Also covered is an introduction to spectroscopy with emphasis on molecular and atomic absorption spectroscopy, as well as on fluorescence spectroscopy. The course will focus on the analytical and instrumental aspects pertaining to these topics. A solid understanding of how to manipulate equilibria functions is essential, as are good skills using spreadsheet software such as Excel.

Key learning objectives:

- Become familiar with key terminology in analytical chemistry
- Expand your titration knowledge and titration curve calculations from CHEM 217 to include precipitation, spectrophotometric and redox titrations
- Perform calculations to determine concentrations of unknown(s) and/or to predict titration curves
- Conduct laboratory experiments with acceptable accuracy and precision
- Learn basics of electrochemistry, ion-selective electrodes and electroanalytical methods
- Balance redox reactions under acidic and alkaline conditions
- Learn basics of atomic and molecular spectroscopy and spectrophotometry including instrumentation design
- Select appropriate method or calibration strategy for a given application
- Critically evaluate sources of errors for a given analysis

Laboratory Experiments

→ As described in the laboratory manual
→ All **five** experiments must be completed
→ A passing grade (60%) for the lab **must** be obtained to receive credits for CHEM218

Grading scale

→ Midterm Exam	**Wed Mar 18, 2026**	15%
→ Final Exam	**TBD, during exam period April 16-May 3**	35% (comprehensive)
→ Homework	(6 Achieve homeworks)	6%
→ In-class quizzes	(best 3 out of 4 in-class quizzes)	12%
→ Group presentation	**April 8, 2026**	7%
→ Laboratory		25%

A passing grade is required in both theory (50%) and laboratory (60%) to obtain credits for CHEM 218. Final exam is mandatory in this course.

Final course grades:
Final course grades are assigned using the following table:

F or R	0-49.5
D-	50-52.9
D	53-56.9
D+	57-59.9
C-	60-62.9
C	63-66.9
C+	67-69.9
B-	70-72.9
B	73-76.9
B+	77-79.9
A-	80-84.9
A	85-89.9
A+	90 and above

R grade will be assigned when theory mark is below 40% or when lab grade is below 60%. Students receiving an "R" grade for the course must repeat all components of the course, including the lab.

DISC

Students receiving a DISC grade in this course will be required to repeat all components of the course, including labs, if they retake it. No lab exemptions for students receiving DISC grade will be granted even if all labs were completed successfully.

Schedule (may be subject to change):

→ Homework due dates:
Weekly as assigned on Achieve and Moodle

→ In-class quiz dates:

January 28, 2026
Feb 11, 2026
Apr 1, 2026
One surprise quiz

Note: Quiz mark will be calculated based on the best 3 out of 4 quizzes.

→ Late policy on homework: **No late homework will be accepted** unless medical note or short-term absence form is provided or an extension was allowed by instructor on the basis of a valid reason. Any homework that is not submitted by due date and time will be assigned a mark of **zero**.
→ Please note that the week of Mar 2 is the midterm break, so there will be **no** class or labs held during this week.

Date	Tentative Topic (subject to change)	Due-date this week
Jan-14	Introduction and precipitation titrations	
Jan-21	Precipitation titrations, oxidation numbers and balancing redox equations	Homework 1
Jan-28	Balancing redox equations and redox titrations	Homework 2, **Quiz 1**, Chem 101 seminar
Feb-4	Redox titrations	Homework 3
Feb-11	Ion-selective electrodes	Homework 4, **Quiz 2**, Chem 101 quiz due
Feb-18	Ion-selective electrodes	Homework 5
Feb-25	Electroanalytical methods	Homework 6
Mar-4	**Midterm break – no classes or labs**	
Mar-11	Spectrophotometry and spectrophotometric titrations	Homework 7,
Mar-18	Midterm	Homework 8, **MIDTERM**
Mar-25	Spectrophotometers; Atomic spectroscopy	Homework 9
Apr-01	Atomic spectroscopy; Exam review	Homework 10, **Quiz 3**
Apr-08	Group presentations	Homework 11

Quizzes:
There will be total of 4 quizzes throughout the term. The best 3 out of 4 quiz marks will be used for the calculation of quiz component. Quiz with the lowest grade will be dropped. Any missed quizzes will not count towards final grade if **medical note or short-term absence form** is provided. Otherwise, a grade of zero will be assigned to any missed quiz. There will be **no make-up quizzes**.

Missed midterm:
If you miss writing the midterm due to valid reason such as medical note or short-term absence form, a suitable make-up date will be arranged to write the midterm. Please contact the instructor within 2 days upon your return to campus to arrange the make-up date.

Textbook

→ Chemistry 217/218 Laboratory Manual
→ one-term access to Achieve learning system which also gives you access to electronic copy of your textbook Daniel C. Harris and Charles A. Lucy, QUANTITATIVE CHEMICAL ANALYSIS, 11th edition,

MacMillan Learning,

Harris 11th edition

- Chapter 7: Let the titrations begin
- Chapter 14: Fundamentals of Electrochemistry
- Chapter 16: Redox Titrations
- Chapter 15: Electrodes and Potentiometry
- Calibration methods: Section 5.3 and 5.4 (review from 217)
- Chapter 17: Electroanalytical Techniques
- Chapter 18: Fundamentals of Spectrophotometry
- Chapter 19: Applications of Spectrophotometry
- Chapter 20: Spectrophotometers
- Chapter 21: Atomic Spectroscopy
- Appendices D, E, F, and H

MOODLE

Reminders of quizzes, homework assignments and selected lecture notes will be posted on Moodle. Please check the course website weekly to access these online materials.

Homework and ACHIEVE Macmillan Learning System

The development of and ability to perform quantitative calculations is an essential part of this course. To solve problems effectively, it is essential that you understand the theoretical principles of analytical chemistry. Solution of numerical problems will constitute the **major** part of the mid-term and final examination. For all homework, quiz, and exam questions, please report final answer to the **correct number of significant figures and show units as appropriate.** We will use Achieve system to help you practice calculations. There will be weekly homework assignments posted on Achieve each week. Six of these will be selected (by draw in the final week of class) to form the basis of your homework grade.

- **Achieve homeworks classified as pre-class are optional** (not graded). They can be used to check your reading comprehension of a chapter and/or to practice answering simple multiple choice questions. These pre-class homeworks are not graded. Their name will always include "Adaptive Quiz" in the title so you can easily recognize them.
- **Post-class problem solving homework** will be counted towards your homework grade, and is due weekly before beginning of the class starting on Jan 21. We will randomly select 6 of these homeworks given throughout the course to calculate your Homework grade (**6x1% each**).

STUDY GUIDE and some GOOD ADVICE

DO's → do all homework questions posted on Moodle and Achieve
→ keep up with the reading
→ seek assistance well before the exams
→ if you perform poorly on particular topic (as shown by Quiz, Homework, Midterm), do extra practice questions within this topic and seek clarification during office hours for any unclear points

DON'Ts → don't underestimate the theory component of this course
→ don't underestimate the lab component of this course
→ don't wait until the last minute to study (practice, practice, …)

Labs (room SP-210): same as in CHEM217

→ Lab supervisor: Khalil Rahman (phone: 848-2424, ext. 3357)
→ Labs start on: week of January 19th, 2026
→ If you're exempted from the lab, you must submit your form by **January 16, 2026 at 4 pm**
→ Missed experiments require a valid excuse (e.g. medical form, short-term absence form) and still require to be performed. Please contact lab supervisor to arrange make-up lab once you return to campus
→ All lab reports must be submitted by **April 15, 2026. After this date, lab reports or corrections to lab marks will not be accepted.**

Behaviour:
All individuals participating in courses are expected to be professional and constructive throughout the course, including in their communications. Concordia students are subject to the Code of Rights and Responsibilities which applies both when students are physically and virtually engaged in any University activity, including classes, seminars, meetings, etc. Students engaged in University activities must respect this Code when engaging with any members of the Concordia community, including faculty, staff, and students, whether such interactions are verbal or in writing, face to face or online/virtual. Failing to comply with the Code may result in charges and sanctions, as outlined in the Code.

Intellectual Property:
Content belonging to instructors shared in online courses or Moodle, including, but not limited to, online lectures, course notes, and video recordings of classes remain the intellectual property of the faculty member. It may not be distributed, published or broadcast, in whole or in part, without the express permission of the faculty member. Students are also forbidden to use their own means of recording any elements of an online class or lecture without express permission of the instructor. Any unauthorized sharing of course content may constitute a breach of the Academic Code of Conduct and/or the Code of Rights and Responsibilities. As specified in the Policy on Intellectual Property, the University does not claim any ownership of or interest in any student IP. All university members retain copyright over their work.

Extraordinary circumstances:
In the event of extraordinary circumstances and pursuant to the Academic Regulations, the University may modify the delivery, content, structure, forum, location and/or evaluation scheme. In the event of such extraordinary circumstances, students will be informed of the changes.

Accessibility statement:
Instructor will strive to make learning experience as accessible and inclusive as possible. If you have accessibility needs that require academic accommodations, please meet with an advisor from the Access Centre for Students with Disabilities (ACSD) as soon as possible to set up an accommodation plan. I also welcome meeting with all students to discuss their accessibility needs. Please reach out if you would like to discuss any accessibility needs with me.

Use of generative AI:

- You are encouraged to make use of technology, including generative artificial intelligence (GenAI) tools to contribute to your understanding of course materials and as learning aids.
- You may use generative artificial intelligence (AI) tools for helping you gather and understand materials for your presentation or selecting your group presentation topic. However, any use of AI in this context has to be disclosed to the instructor using specific Moodle prompt. Any information and

citations suggested by AI have to be verified prior to use in the presentation. You are ultimately accountable for all the work you submit to be assessed and assigned grades.

- **You may not use artificial intelligence tools for taking exams, quizzes or solving homework assignments. The knowing use of generative artificial intelligence (GenAI) tools, including ChatGPT and other AI writing and coding assistants, for the completion of, or to support the completion of, an examination, quiz, or homework, may be considered as academic misconduct in this course.**

"CHEM 101": The Academic Code of Conduct: Ethical Use of Information Sources

MANDATORY QUIZ AND SEMINAR

As part of your CHEM course, you are ***required*** to i) attend a Chemistry and Biochemistry Departmental Seminar on the academic conduct code and the appropriate use of information sources and ii) pass the online quiz associated with this seminar (the passing grade for the quiz is 100%). (**Note:** this quiz is graded by the Department of Chemistry and Biochemistry, and you do not have access to it until after you have attended the seminar. Therefore, any other quiz you may have taken on the academic code of conduct does not count toward the CHEM 101 requirement.) The aim of this seminar and quiz is to clarify the academic conduct code in terms of which practices will be considered unacceptable with regards to work submitted for grading in your CHEM course. **You are only exempt from repeating the seminar and the quiz if you have done both in Winter 2021 or more recently,*** otherwise you are required to repeat both this term. This short seminar (1 hour) will be held at the following times (note that you will not be given credit if you join too late and/or leave too early):

Date (Winter 2026)	Time	Mode	Registration link
Jan. 27 (Tuesday)	21:00-22:00	Zoom	https://concordia-ca.zoom.us/meeting/register/abB53MlnQSC6LrNsCnRepw
Jan. 29 (Thursday)	21:00-22:00	Zoom	https://concordia-ca.zoom.us/meeting/register/0v3k0gZLTgGLTXRYpNJ7zg

As space for each of the Zoom seminars is limited, please **register early** for your preferred slot (copy the corresponding link above into your browser). **Look out** for the confirmation email from us (Elizabeth Montesano) with the link to the actual seminar. Then do not forget to **attend** that seminar slot on the date above: put it into your scheduler/agenda. You will **not** receive a reminder on or before the date!

We will take attendance at the Zoom seminar; this means that you must log in with the code that was supplied for your registration. Do not "join a friend" in watching at their computer.

If you do not complete this course requirement, your final grade for the course may be lowered by one full letter grade with an incomplete (INC) notation until such time as this requirement is completed. Please refer to the undergraduate calendar (section 16.3.5) for details on removal of an incomplete notation.

* You are exempt if you can locate your ID in the pdf file located on the Departmental web site (http://www.concordia.ca/content/dam/artsci/chemistry/docs/Compliance-list.pdf) and if there is no entry in the "quiz" column for you. If the list does not say "Winter 2021-Fall 2025", you have the wrong list: clear your browser data.

PLAGIARISM AND OTHER FORMS OF ACADEMIC DISHONESTY

The Academic Code of Conduct can be found in section 17.10 of the academic calendar and on the Academic Integrity site (https://www.concordia.ca/conduct/academic-integrity.html). Any form of unauthorized collaboration, cheating, copying or plagiarism found in this course will be reported and the appropriate sanctions applied. The mandatory seminar is a clear and fair opportunity to learn what our faculty regards as academic misconduct. Failure to take part in this learning opportunity and thus ignorance of these regulations is no excuse and will not result in a reduced sanction in any case where academic misconduct is observed.