

# CHEM 203

## Forensic Analysis

### Section EC

### Fall 2021

**This syllabus is subject to change and any changes will be posted in the Announcements section of your eConcordia portal.**

**Disclaimer: In the event of extraordinary circumstances beyond the University's control, the content and/or evaluation scheme in this course is subject to change.**

## About the Course

### About the Course/ Course Description

This course is intended to introduce the non-science student to the fundamentals of chemical analysis as it is used in modern forensics.

First and foremost, this is a chemistry course rather than a forensics/CSI course. As such, there will be a fair amount of Chemistry to learn but, it will be mostly conceptual rather than memorizing all sorts of chemical details. The chemistry that we discuss is all focused on its application to forensics.

The course spans from a basic introduction to the field of forensics within the Canadian context right through to a detailed discussion of current advanced methods such as DNA profiling methods. The Canadian focus to the course will illustrate some of the important differences between what is done in Canada compared to the US (where the book originates from). We also mix in the importance of current research to illustrate that forensics is a growing and changing

### Course Material

The material for this course consists of material drawn from the textbook as well as supplementary materials such as journal articles, sample laboratory reports, newspaper articles etc. There is also a set of supplementary information on the course website that is there for your own personal interest. The Reading list identifies the required material. Exams and quizzes will cover only the required readings/materials. Some of the supplementary material is there to assist you in the assignments (e.g. an Excel primer to assist you in preparing the Calibration spreadsheet).

**Instructor:** Cameron Skinner

**Instructor Contact Information:** [ForensicChem@concordia.ca](mailto:ForensicChem@concordia.ca)

This email address allows you to contact me directly with any general inquiries. If you have any questions or concerns about the course, or if you require further feedback, please do not hesitate to use this email.

**Note:** I am also acting as your TA for this course. Please allow for a 24 hour response time during the week (Monday-Friday). Emails may be checked over weekend period but, this is not certain.

**Office hours:** Generally they will be held Thursdays 1-3 pm (Montreal time) on Zoom (link below). I am planning on being on-campus (Loyola, SP-275-27) so there is also a possibility of face-to-face meetings. On-line office hours will generally not be recorded but, at your request, can be if you want to review the material discussed. For conceptual problems, questions regarding course components, or for other questions that cannot be answered quickly in an email, please see me during my office hours.

For some of you this course may be a handful. DO NOT allow yourself to fall behind in the course because you don't understand something in particular and are too hesitant to ask! I love it when I can turn the "light on" for a student. Preferably ask at office hours but, if I am available outside of those times it is also okay! If you (as a group) want a Zoom session on a particular topic let me know and we'll put something together!

**Course Introduction Session:** There will be a Zoom meeting Thursday September 9<sup>th</sup>, at 1 pm (Montreal time) to introduce myself and answer questions about the course. I will record this session and the file will be posted later for those who cannot attend.

**Link for Office hours and scheduled Zoom Sessions:**

Thursdays Sept 9 to Dec 9 1-3 PM Montreal time

<https://concordia-ca.zoom.us/j/83281994348?pwd=OVI5TE0xTHZ6RVRqUnlOZFNUdXU3dz09>

Meeting ID: 832 8199 4348 Passcode: 772268

**Discussion Board:** Feel free to use the discussion forum to stay connected with your course mates. You can post questions for your peers to respond to, but I will not be checking the correctness of the forum replies by students. If you have a question for me, please email me your questions, I will not be checking the forum for questions intended for me to answer.

**Technical requirements:** Please refer to the following link for a list of the hardware, browser and plug-in requirements: <https://www.concordia.ca/academics/online-courses/how-it-works/technical-requirements.html>

**For technical assistance:** For any technical questions or inquiries such as account issues or login problems, please contact our HelpDesk at: [helpdesk@econcordia.com](mailto:helpdesk@econcordia.com) The help desk can be reached Monday through Friday between 9 a.m. and 5 p.m. (Eastern time).

**Textbook:**

*Forensic Science and Chemistry.* Custom ebook, ISBN: 132361320X Should cost ≈ \$65.

Forensics parts taken from:

*Forensic Science: From the Crime Scene to the Crime Lab, Third Edition* by Richard Saferstein

*Fundamentals of Forensic Science, Second Edition* by Max M. Houck and Jay A. Siegel

Chemistry parts taken from:

*Introductory Chemistry: Atoms First, Fifth Edition* by Steve Russo and Michael E. Silver

**Course Website**

The course website can be accessed at [www.econcordia.com](http://www.econcordia.com)  
Your eConcordia account will be valid until the end of the term for which you are registered.

Your account will allow you to access the online course material, which includes videos, notes, discussion boards, all graded course components, useful links, readings and many more resources from the course website for the duration of the term.

# Assessments

## Graded Assessments

There are 4 assignments in this course along with 6 quizzes. Each quiz (sum of its parts) is worth 5% of your final grade. There are two potential grading schemes in this course (A & B). In scheme A, everything counts (30% for assignments, 30% for quizzes and 40% for the final exam). In scheme B the quizzes are weighted less **and** your poorest quiz is NOT counted (30% for assignments, 25% for quizzes and 45% for the final exam). The weight of the removed quiz is added to the final exam. I will calculate your overall grade based on both schemes and assign the best grade.

Lessons covered	Description	(Scheme A) Weight (%)
1: Introduction 2: Science	<ul style="list-style-type: none"> <li>Crossword puzzle assignment</li> </ul>	6
3: Chemistry	<ul style="list-style-type: none"> <li>Electronegativity exercise assignment</li> <li>Lesson 3 On-line quiz part I: Chemistry quiz</li> <li>Lesson 3 On-line quiz part II: Molecular formula and weight quiz</li> </ul>	6 3 2
4: Chemical Analysis 5: Mass spectrometry	<ul style="list-style-type: none"> <li>Calibration assignment</li> <li>Lessons 4 &amp; 5 On-line quiz</li> </ul>	10 5
6: Alcohol 7: Chromatography	<ul style="list-style-type: none"> <li>Lessons 6 &amp; 7 On-line quiz</li> </ul>	5
8: Drugs 9: Toxicology	<ul style="list-style-type: none"> <li>Lessons 8 &amp; 9 On-line quiz</li> </ul>	5
10: Fingerprints	<ul style="list-style-type: none"> <li>Fingerprint assignment (given in the form of a quiz)</li> </ul>	8
11: DNA	<ul style="list-style-type: none"> <li>Lesson 11 On-line quiz</li> </ul>	5
12: Arson and explosion	<ul style="list-style-type: none"> <li>Lesson 12 On-line quiz part I: Arson quiz</li> <li>Lesson 12 On-line quiz part II: Explosives quiz</li> </ul>	2.5 2.5
This exam is comprehensive and covers the required readings/materials in all lessons	<ul style="list-style-type: none"> <li>On-line Final Exam</li> </ul> <p><b><u>NB: to pass the course you must receive at least 50% on the final exam</u></b></p>	40
	Total	100

## Description of Graded Assessments

### Assignments:

Crossword puzzle assignment: Download the puzzle, fill it in and send back the completed puzzle. Covers terminology from Lessons 1 & 2

Electronegativity exercise assignment: Download the exercise, fill it in and send back the completed exercise. Deals with molecular structure (adding-in missing atoms on a structure) and calculating which bonds are polar. Complete after Lesson 3 (Chemistry)

Calibration assignment: You will be assigned a data set that you will plot, use to calculate the calibration equation, verify that quality control samples have passed and calculate the concentration of several samples. You will then prepare a report of the process you followed, your results and findings. Wait until you have completed the Alcohol lesson (Lesson 6) as there is a calibration example shown in the lesson. There are also additional materials to help support you if Excel and/or algebra aren't your thing!

Fingerprint quiz: You will use an annotated fingerprint image and identify the minutia (fingerprint details) – nothing to do with chemistry but is interesting given the importance of fingerprints in forensics. Complete after Lesson 10.

### On-line quizzes:

Throughout the course there will be periodic quizzes that are meant to directly test your knowledge of the Lesson materials but, will assume that you have learned (and retained) the previous material too! Most are multiple-choice.

Please note:

- There is 1 attempt per quiz, but you have essentially 24 hours to complete it.
- Missed quizzes cannot be taken on an alternate day.
- The fingerprint exercise in lesson 10 is considered to be an assignment despite the fact it is delivered in the form of an online quiz. You have 24 hours to complete it. All other assignments are open for several days.

### Final Exam:

We are expecting the final exam to be on-line using COLE (examination tool) and Proctorio (proctoring tool). However, given the current COVID situation keep your eyes peeled for announcements. It is comprehensive and covers all the required readings/materials in all lessons. NB: to pass the course you must receive at least 50% on the final exam

## Grades

In order to view your grades throughout the semester, click on the My Grades link in your eConcordia portal.

It is your responsibility to ensure your work has been received (to be verified as outlined in your assignment instructions) and to contact your TA/professor via e-mail for clarification if you have any questions concerning your grades.

Your final letter grade for the course will be posted in your MyConcordia Portal at the end of the term.

## Mark Breakdowns

Grade range	Letter equivalent	Grade range	Letter equivalent
Grade < 50.0% on final exam	F	66.7-69.9	C+
<50.0	F	70.0-73.3	B-
50.0-53.3	D-	73.4-76.6	B
53.4-56.6	D	76.7-79.9	B+
56.7-59.9	D+	80.0-86.6	A-
60.0-63.3	C-	86.7-92.9	A
63.4-66.6	C	≥93.0	A+

## Plagiarism and other forms of academic dishonesty

The Academic Code of Conduct can be found in section 17.10 of the academic calendar (<http://www.concordia.ca/academics/undergraduate/calendar/current/17-10.html>). Any form of unauthorized collaboration, cheating, copying or plagiarism found in this course will be reported and the appropriate sanctions applied.

The Department of Chemistry and Biochemistry offers a seminar on the academic conduct code and the appropriate use of information sources which aims to clarify what practices will be considered unacceptable with regards to work submitted for grading in Chemistry and Biochemistry courses. Attendance at this seminar is **highly recommended** and represents 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. (**Note:** This is **not** the University's quiz you may have been asked to take when you first registered and logged into the myConcordia portal; this one is similar, but graded by the Department of Chemistry and Biochemistry, and you do not have access to it until after you have attended the seminar.) This short seminar (1 hour) will be held in the first week or two of the term.

<b>Date (Fall 2021)</b>	<b>Time</b>	<b>Mode</b>	<b>Registration link</b>
Sept. 22 (Wednesday)	21:00-22:00	Zoom	<a href="#">meeting/register/1</a>
Sept. 23 (Thursday)	21:00-22:00	Zoom	<a href="#">meeting/register/2</a>
Sept. 27 (Monday)	19:00-20:00	Zoom	<a href="#">meeting/register/3</a>

As space for each of the Zoom seminars is limited, please **register** for your preferred evening slot: you will receive an email invitation to do so. Then do not forget to **attend** that seminar slot! We will take attendance at the Zoom seminar.

Besides this highly recommended seminar offered by the Department of Chemistry and Biochemistry, it is **required** that all students enrolled in an eConcordia course take the Academic Integrity Quiz that pertains to academic integrity in an online course. You will not be able to access this online course unless you have completed the quiz. Once you initially login, you will find access to the quiz. For more information, please access the Academic Integrity Module found in the following link: <https://www.econcordia.com/home/sor.aspx>

# Important Information

<b>Topic</b>	<b>Link</b>
Academic Integrity	<a href="#">Academic Integrity</a>
Educational Technology Guidelines	<a href="#">Concordia Educational Technology Guidelines for Faculty and Students (the "Guidelines")</a>
Access Centre for Students with Disabilities	<a href="#">ACSD</a>
Concordia Library Citation & Style Guides	<a href="#">How to cite...</a>
Course Communication Tools	<a href="#">Communication</a>
eConcordia Policies	<a href="#">Policies</a>
Final Exams Information	<a href="#">Final Exams</a>
Helpdesk/Support	<a href="#">FAQ</a>
Refunds	<a href="#">Refunds</a>
Technical Requirements	<a href="#">Technical Requirements</a>
Tips for Studying Online	<a href="#">Studying Tips</a>
Tips on how to reach online learning goals (learning modules)	<a href="#">How to Succeed @ eConcordia</a>



# Tutorial Companies

Please note that private tutorial companies, some of whom aggressively promote their services on and off campus, are not authorized by Concordia University to distribute flyers on University premises and may not use Concordia University facilities to promote or provide their services.

Concordia University and its academic departments do not have any affiliation with these companies even though names such as JMSB, Concordia, or references to specific departments often appear in a visible way.

# CHEM 203 - Forensic Analysis

## Agenda

### Fall 2021

All deadlines indicated are on the due date listed by 11:59 p.m. unless otherwise indicated.

Week 1 : September 6 - September 12	
	Lesson 1: Introduction to Forensics
<b>September 07</b>	<b>Classes begin, fall term</b>
<b>September 07</b>	<b>Discussion Board opens at 2 PM</b>
<b>September 09</b>	<b>Live session introduction to course and prof.</b>
Week 2: September 13 - September 19	
	Lesson 2: Fundamentals of Science
<b>September 13</b>	<b>Assignment available: Crossword puzzle</b>
Week 3: September 20 - September 26	
	Lesson 3: Fundamentals of Chemistry
<b>September 20</b>	<b>Deadline to add fall-term courses (are you really registered?)</b>
<b>September 20</b>	<b>Deadline for withdrawal with tuition refund (DNE) from fall-term courses (get me out of here!!)</b>
<b>September 20</b>	<b>Assignment due: Crossword puzzle</b>
<b>September 20</b>	<b>Assignment available: Electronegativity</b>
Week 4: September 27 - October 3	
	Lesson 4: Chemical Analysis
<b>September 27</b>	<b>Assignment due: Electronegativity</b>
<b>September 30</b>	<b>On-line quiz for Lesson 3 (part I): Chemistry (24 HR QUIZ)</b>
Week 5: October 4 - October 10	
	Lesson 5: Mass Spectrometry
<b>October 07</b>	<b>On-line quiz for Lesson 3 (part II): Molecular formula and weight (24 HR QUIZ)</b>

Week 6: October 11 - October 17	
	Lesson 6: Alcohol
October 11	<b>Thanksgiving Day - University closed.</b>
October 14	<b>On-line quiz for: Lessons 4 &amp; 5: Chemical Analysis &amp; Mass Spectrometry (24 HR QUIZ)</b>
Week 7: October 18 - October 24	
	Lesson 7: Chromatography
October 18	<b>Calibration Assignment available: this may require significant effort. Attempt only after seeing a calibration example in the Alcohol lesson).</b>
Week 8: October 25 - October 31	
	Lesson 8: Drugs
October 28	<b>On-line quiz: Lessons 6 &amp; 7 (24 HR QUIZ) Alcohol and Chromatography</b>
Week 9: November 1 - November 7	
	Lesson 9: Toxicology
November 01	<b>Calibration Assignment due (data, report, Excel sheet)</b>
Week 10: November 8 - November 14	
	Lesson 10: Fingerprints
November 08	<b>Deadline for academic withdrawal (DISC) from fall-term courses</b>
November 11	<b>On-line quiz: Lessons 8 &amp; 9 (24 HR QUIZ) Drugs and Toxicology</b>
November 12	<b>Last day to register with the Access Centre for Students with Disabilities and receive exam accommodations for the final examination period.</b>
Week 11: November 15 - November 21	
	Lesson 11: DNA
November 18	<b>Fingerprint Assignment (24 HR)</b>
Week 12: November 22 - November 28	
	Lesson 12: Fire/arson and explosion

<b>November 25</b>	<b>On-line quiz: Lesson 11 (DNA – calling alleles) (24 HR QUIZ)</b>
<b>Week 13: November 29 - December 5</b>	
<b>November 29</b>	<b>Last day for instructor-scheduled tests or examinations</b>
<b>Week 14: December 6 - December 12</b>	
<b>November 29</b>	<b>On-line quiz: Lesson 12 (part I): Arson (24 HR QUIZ) On-line quiz: Lesson 12 (part II): Explosives (24 HR QUIZ)</b>
<b>December 06</b>	<b>Last day of classes</b>
<b>Examinations Period: December 8 - December 22</b>	
	<b>The exam is comprehensive and covers:</b> • <b>ALL required readings (see the Readings list) and required lesson material in all lessons</b>
	<b>Final Exam date, time and location is posted on your MyConcordia Portal</b>