

ORIGINAL COURSE IMPLEMENTATION DATE: REVISED COURSE IMPLEMENTATION DATE: COURSE TO BE REVIEWED (six years after UEC approval): Course outline form version: 10/27/2017 September 2000 September 2019 October 2022

OFFICIAL UNDERGRADUATE COURSE OUTLINE FORM

Note: The University reserves the right to amend course outlines as needed without notice.

Course Code and Number: CHEM 241		Number of Credits: 4 Course credit policy (105)								
Course Full Title: Analytical Chemistry	<u>.</u>									
Course Short Title:										
(Transcripts only display 30 characters. Departments may recommend a short title if one is needed. If left blank, one will be assigned.)										
Faculty: Faculty of Science		Department (or program if no department): CHEMISTRY								
Calendar Description:										
An introduction to analytical chemistry with an experimental measurements, equilibrium, prin chromatography. Laboratory experiments illu	n emphasis c nciples of titri strate lecture	on analysis of so imetry, electroc a materials.	olutions. L hemical m	ecture material includes nethods, statistical analys	handling and interpreting of sis, analytical separation and					
Prerequisites (or NONE):										
Corequisites (if applicable, or NONE):	None									
Pre/corequisites (if applicable, or NONE):	None									
Antirequisite Courses (Cannot be taken for additional credit.) Former course code/number: Cross-listed with: Dual-listed with: Equivalent course(s): (If offered in the previous five years, antirequisite course(s) will be included in the calendar description as a note that students with credit for the antirequisite course(s) cannot take this course for further credit.) Typical Structure of Instructional Hours Lecture/seminar hours 45 Tutorials/workshops/Seminars 39 Experiential (field experience, practicum, internship, etc.) 39			Special Topics This course is offered with different topics: No Yes (Double-click on box to select it as checked.) If yes, different lettered courses may be taken for credit: No Yes, repeat(s) Yes, no limit (The specific topic will be recorded when offered.) Transfer Credit Transfer credit already exists: (See bctransferguide.ca.) No Yes Submit revised outline for rearticulation: No Yes (If yes, fill in transfer credit form.) Grading System							
Supervised online activities			🖂 Lette	Letter Grades Credit/No Credit Expected Frequency of Course Offerings:						
Other contact hours:			Expect							
	Total hours	s 84	Annuall	у						
Labs to be scheduled independent of lecture	hours: 🗌 N	lo 🛛 Yes	(Every	semester, Fall only, annu	ually, every other Fall, etc.)					
Department / Program Head or Director: Cory Beshara				Date approved:	April 13, 2018					
Faculty Council approval				Date approved:	September 7, 2018					
Dean/Associate VP: Greg Schlitt (Acting)				Date approved:	September 7, 2018					
Campus-Wide Consultation (CWC)	Campus-Wide Consultation (CWC)				October 19, 2018					
Undergraduate Education Committee (UEC) approval				Date of meeting:	October 26, 2018					

Learning Outcomes:

Upon successful completion of this course, students will be able to:

- Identify absolute and relative errors.
- Identify random and systematic errors.
- Present results, and test for precision and accuracy.
- Prepare standard solutions and use appropriate calibration methods.
- Use Microsoft Excel to perform scientific calculations and produce graphs.
- Use volumetric glassware correctly to prepare solutions and perform titrations.
- Perform a back titration and analyse data.
- Use pH meter and ion-selective electrodes correctly to perform a redox titration.
- Describe basic concepts of analytical separation.
- Describe basic concepts of precipitation and perform a precipitation titration.
- Describe basic chromatographic theory (HPLC and GC).

Prior Learning Assessment and Recognition (PLAR)

Yes No, PLAR cannot be awarded for this course because

Typical Instructional Methods (*Guest lecturers, presentations, online instruction, field trips, etc.; may vary at department's discretion.*) Lectures, labs, group problem-solving sessions.

NOTE: The following sections may vary by instructor. Please see course syllabus available from the instructor.

 Typical Text(s) and Resource Materials (If more space is required, download Supplemental Texts and Resource Materials form.)

 Author (surname, initials)
 Title (article, book, journal, etc.)
 Current ed.
 Publisher
 Year

 1.
 Harris, D.C.
 Quantitative Chemical Analysis, 9th ed
 Image: Freeman and Co
 2016

 2.
 Image: Text of the space is required Additional Supplies and Materials (Software, hardware, tools, specialized clothing, etc.)
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Typical Evaluation Methods and Weighting

Final exam:	40%	Assignments:	5%	Field experience:	%	Portfolio:	%
Midterm exam:	30%	Project:	5%	Practicum:	%	Other:	%
Quizzes/tests:	%	Lab work:	20%	Shop work:	%	Total:	100%

Details (if necessary):

Typical Course Content and Topics

- Statistics
- Method Validation
- Chemical Equilibrium
- Titrations
- Fundamentals of Electrochemistry
- Electrodes and Potentiometry
- Redox Titrations
- Introduction to Analytical Separations
- Gas Chromatography (GC) and High-Performance Liquid Chromatography (HPLC)

LABORATORY EXPERIMENTS

Representative experiments for this course:

- Introduction to Microsoft Excel and graphing with Microsoft Excel
- Dilution and calibration curve
- Precipitation and Ksp
- Fajans titration
- Wine titration
- pH meter and galvanic cell
- Redox titration
- HPLC