

February 2027

OFFICIAL UNDERGRADUATE COURSE OUTLINE FORM

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

Course Code and Number: CHEM 116		Number of Credits: 1 Course credit policy (105)					
Course Full Title: Thermodynamic Aspects of General Chemistry for Engineering Students Course Short Title: Chemical Thermodynamics							
(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:							
Extends the topics of CHEM 113 with an introduction to chemical thermodynamics needed for the Engineering Transfer Program Common Core.							
Note: Students with credit for CHEM 114 cannot take this course for further credit.							
Prerequisites (or NONE):	None.						
Corequisites (if applicable, or NONE):	None.						
Pre/corequisites (if applicable, or NONE): CHEM 113.							
Antirequisite Courses (Cannot be taken for additional credit.)			Special Topics (Double-click on boxes to select.)				
Former course code/number:			This course is offered with different topics:				
Cross-listed with:			\square No \square Yes (If yes, topic will be recorded when offered.)				
Dual-listed with:			Independent Study				
Equivalent course(s): CHEM 114			If offered as an Independent Study course, this course may				
(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.)			be repeated for further credit: (If yes, topic will be recorded.)				
			Transfer Credit				
Typical Structure of Instructional Hours			Transfer credit already exists: <i>(See <u>bctransferguide.ca</u>.)</i> ⊠ No □ Yes				
Lecture/seminar hours							
Tutorials/workshops		Submit outline for (re)articulation:					
Supervised laboratory hours							
Experiential (field experience, practicum, internship, etc.))	Grading System				
Supervised online activities			Letter Grades				
Other contact hours:			Maximum enrolment (for information only): 36				
Total hours 18		Expected Frequency of Course Offerings:					
Labs to be scheduled independent of lecture hours: 🛛 No 🗌			Annually (Every semester, Fall only, annually, etc.)				
Department / Program Head or Director:				Date approved:	December 2020		
Faculty Council approval				Date approved:	January 8, 2021		
Dean/Associate VP:				Date approved:	January 8, 2021		
Campus-Wide Consultation (CWC)				Date of posting:	February 5, 2021		
Undergraduate Education Committee (UEC) approval			Date of meeting:	February 26, 2021			

CHEM 116

Learning Outcomes:

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

- Describe the principles of chemical thermodynamics.
- Illustrate how the principles of chemical thermodynamics relate to the spontaneity of chemical and electrochemical processes.
- Use the principles of chemical thermodynamics to explain the effects of pressure and temperature on phase stability.

Prior Learning Assessment and Recognition (PLAR)

Yes INO, 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.) Lecture.

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

Тур	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.	Olmsted J. et al	Chemistry 3rd ed.	\boxtimes	Wiley	2016		
2.							
3.							
4.							
5.							
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Required Additional Supplies and Materials (Software, hardware, tools, specialized clothing, etc.)

Typical Evaluation Methods and Weighting

Final exam:	50%	Assignments:	20%	Field experience:	%	Portfolio:	%
Midterm exam:	%	Project:	%	Practicum:	%	Other:	%
Quizzes/tests:	30%	Lab work:	%	Shop work:	%	Total:	100%

Details (if necessary):

Typical Course Content and Topics

Thermochemistry (Ch. 3):

- Heat and work, energy, the first law of thermodynamics
- Heat of isochoric and isobaric processes, enthalpy
- Energy and enthalpy changes in chemical reactions, Hess's law

Spontaneity (Ch. 12)

- Reversible and irreversible process, spontaneity
- Entropy, the second law of thermodynamics
- Free energy and Gibbs free energy
- Phase transitions and phase diagrams
- Spontaneity of chemical reactions under isochoric and isobaric conditions

Electrochemistry (Ch. 17)

- Galvanic cell and its elements, shorthand cell notations
- Active and inert electrodes, electrode reactions
- Cell and electrode potentials, standard reduction potentials
- Concentration dependence of electrode potentials, Nernst equation