DEPARTMENT OF CHEMISTRY & CHEMICAL TECHNOLOGY
Chemistry (Science Program)

General Chemistry
202-SN1-RE
Winter 2026

INSTRUCTORS

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SECTION(S): 13 - 14

INSTRUCTOR ACCESSIBILITY

Office hours: refer to the teachers schedule on Omnivox (Léa), Moodle or on the Chemistry Department information board.
Out of class communication methods: Email or Omnivox (MIO).
The instructor will respond to students' inquiries during office hours and within a reasonable delay.

COURSE PLATFORM(S)

Course materials can be accessed via Moodle, Léa, etc.

COURSE OBJECTIVES

This course provides the first chemistry component of the two-semester college level general chemistry program given at the CEGEP level. In the Science Program, it fulfils competency 00UL [To analyze chemical and physical changes in matter using concepts associated with the structure of atoms and molecules.]. It also partially fulfils competency 00UU [To apply what they have learned to one or more subjects in the sciences] Although students will have encountered many of the topics in the course in a qualitative manner in Chemistry 504 or Chemistry 202-001, now they will undertake a more complete study of these and other new topics with a strong quantitative bias as shown by the great emphasis on problem solving in this course. Students will find that much of this course provides an introduction to Analytical Chemistry, Physical Chemistry, Instrumental Analysis and Industrial Chemistry.

A complete description of the objectives and standards of this course is provided in the document describing the Dawson College Science Program. It is located at:

https://www.dawsoncollege.qc.ca/programs/science-medical-studies-and-engineering/science

COURSE COMPETENCIES

The following competency is fully achieved.
0C01 - Analyze properties of matter and chemical changes.

1. Use chemical language and symbols.
2. Carry out the quantitative analysis of chemical systems.
3. Explain the properties of the elements and how they relate to the periodic classification.
4. Explain the structure of matter according to the types of chemical bonds.
5. Explain the main macroscopic properties of matter.
6. Verify, using an experimental method, some chemical and physical properties of matter.

GENERAL LEARNING OUTCOMES

1. Use chemical language, symbols and nomenclature to characterize or represent basic chemical concepts.
2. Solve quantitative examinations of chemical systems using concepts of moles, concentrations, or stoichiometry.
3. Explain the properties of the elements based on the modern theory of atomic structure which accounts for periodicity in terms of the electron arrangement in atoms.
4. Explain the structure and bonding that characterizes polyatomic ions and molecular compounds.
5. Use the scientific method and its related laboratory techniques and materials to evaluate in a safe environment some chemical and physical properties of matter.

PRE-REQUISITE

Secondary V chemistry 534 (or equivalent)

PONDERATION: 3-2-3

Lecture 30 of 1½ hours, 45 hours

Laboratory work: 15 of 2 hours, 30 hours

Homework: Minimum 3 hours per week, 45 hours

EVALUATION SCHEME AND SCHEDULE

Progress in this course will be evaluated according to ONE of the schemes described below. The particular choice of grading scheme and tentative dates of the class tests and other evaluation activities (quizzes, assignments, etc.) will be announced by your instructor at the beginning of the semester.

Scheme 1			
Evaluation		**Date**	**Grade (%)**
Theory	Progress Test 1	February 26	15
	Progress Test 2	March 26	15
	Progress Test 3	May 7	15
	Final Exam (cumulative)		40
Laboratory work			15

Scheme 2			
Evaluation		**Date**	**Grade (%)**
Theory	Progress Test 1		15
	Progress Test 2		15
	Other Activities		15
	Final Exam (cumulative)		40
Laboratory work			15

This course has a scheduled in-person final examination which will take place during the final examination period. The final examination may include at least one question on the lab material.

The passing grade in this course is 60%.

Students must pass the theory component as well as the laboratory component of the course. Students who fail either one of the above components, theory or laboratory, will receive no more than 55% as their final grade for the course. Students who miss more than three laboratory experiments will receive an automatic failing grade in the laboratory component of the course.

Students who miss more than 50% of in-semester class tests for any reason are recommended to request an authorized absence for the course since the instructor cannot assess the attainment of the competencies; the instructor will be obliged to give the student a failing grade.

Dawson College is committed to maintaining standards of academic excellence and promoting equitable and effective evaluation of student learning. The Institutional Student Evaluation Policy (ISEP) outlines the roles and responsibilities of students, teachers, and administrators with regard to student evaluation, and sets out the rules about assessment, grades and academic standing. ISEP is available on the Dawson website.
https://www.dawsoncollege.qc.ca/governance/institutional-student-evaluation-policy/

Previous Final Examinations with their solutions may be found at the Chemistry Department Home Page:

https://www.dawsoncollege.qc.ca/chemistry/previous-final-exams

SUBMISSION OF MATERIAL FOR EVALUATION

Laboratory reports and home assignments must be completed and handed in no later than the time specified by the teacher. A grade of zero will normally be given for any report or assignment that is not submitted by the deadline.

Laboratory reports, including data sheets, must be written in INK. All other materials submitted for grading (i.e., tests, quizzes, assignments, etc.) must be written in INK to preserve the student's right to grieve. Student's work will be validated by the end of the period by the instructor.

Only persons whose names appear on the attendance sheet for an experiment will have their report for that experiment marked.

REQUIRED TEXT AND MATERIALS

- Complete Learning Package of Zumdahl, Chemistry, 11th Edition, Brooks/Cole (CENGAGE Learning), 2024 (Hardcover textbook with Solutions Manual or Electronic copy)
- Dawson College Laboratory Manual for General Chemistry (202-SN1-RE). Electronic version provided by your instructor.
- Online documents are accessible from LEA, Moodle, etc. according to the teacher's instructions.
- Students will find a calculator essential. The use of programmable calculators is not allowed during quizzes, tests and the final exam.
- Safety glasses and a lab coat must be worn in the laboratory at all times.

TEACHING METHODS

Lectures, laboratory work and reports, home problem-solving and self-study, quizzes, and progress tests are among the methods used in this course.

ATTENDANCE AND COURSE PARTICIPATION REQUIREMENTS

Students should refer to the Institutional Student Evaluation Policy (ISEP section IV-C) regarding attendance. Attendance is compulsory for all laboratory sessions, class tests, quizzes, and the final examination. Unjustified absence will result in an automatic grade of zero.

LITERACY STANDARDS

In accordance with College policy, all materials submitted for evaluation must demonstrate proper use of the English language.

LABORATORY SAFETY REGULATIONS

Students enrolling in this course will be exposed to chemicals which may be irritating or hazardous. For those persons with a sensitive medical condition such as allergies, additional precautions beyond the normal laboratory requirements of wearing safety glasses and laboratory coats are recommended. Such precautions may include wearing supplementary accoutrements such as additional eye protection or garments.

Exposure to certain chemicals during the first trimester of pregnancy, in particular, should be avoided. Please consult with your doctor and then communicate with your professor in writing about continuing in the course or other options available to you.

The following safety rules will be enforced starting on the first laboratory period:

1. WEARING SAFETY GLASSES AND LAB COAT IS OBLIGATORY. Students without safety glasses or lab coats will be asked to leave the laboratory area and will be considered absent for that period.
2. No smoking, eating, or drinking is permitted at any time in the laboratory.
3. Keep your coats, textbooks, and other bulky personal items out of the working area.
4. Report any accident, however minor, to your instructor at once.
5. Non-compliance with any of these safety regulations will result in expulsion from the Lab. Consequently, the student will receive a zero grade for that lab exercise.

ACADEMIC INTEGRITY

Cheating and plagiarism are serious academic offences. Action in response to an incident of cheating or plagiarism, up to and including the failure of a student in the course, is within the jurisdiction of the teacher, in accordance with the College's Institutional Student Evaluation Policy (ISEP).

According to ISEP, every instance of cheating or plagiarism leading to a resolution that impacts on a student's grade must be reported, with explanation, in writing to the appropriate Dean. (ISEP section V-A.)

INTENSIVE COURSE CONFLICTS STATEMENT

If a student is attending an intensive course, the student must inform the teacher, within the first two weeks of class, of the specific dates of any anticipated absences.

POLICY ON RELIGIOUS OBSERVANCE

Students observing religious holidays must inform each of their teachers, in writing, of the specific dates as soon as possible, but no later than the end of the second week of classes. This applies both to the semester or term, as well as to any final examination period. As prescribed in the ISEP Policy on Religious Observances. (ISEP Section IV-D).

A form for this purpose is available at the end of this document. Your teacher will inform you of any modifications to planned course activities resulting from the teacher's own religious commitments.

STUDENT OBLIGATIONS

Everyone has the right to a safe and non-violent environment. Students are obliged to conduct themselves as stated in the Student Code of Conduct and in the ISEP (Section II-D), regarding the roles and responsibilities of students.

Students are expected to be familiar with the general policies and guidelines of the Department of Chemistry & Chemical Technology regarding laboratory and classroom comportment (page 5 of this Outline), as well as with the College Policies on students' rights and obligations, cheating and plagiarism, and literacy, as outlined in the College's Institutional Student Evaluation Policy (ISEP).

1. Students must not talk to or communicate with their classmates when the classroom or pre-lab lecture is in progress. The lecture begins precisely at the assigned time or as soon as the lecturer enters the classroom.
2. Students must remain in their seats during classroom lectures and give their full attention to the lecturer.
3. Students must not leave the classroom before the lecture is completed without notifying the teacher at the beginning of the class. The full lecture period is required for your teacher to do an effective job of presenting the course objectives.
4. Students must be on time for a lecture unless there is a valid reason. Any student who does arrive late must be seated as soon as possible near the door of the classroom with minimum disruption. At the end of the lecture, this student must speak to the teacher about the late arrival.
5. For late arrivals at the laboratory sessions, the student must see the teacher immediately after entering the lab. The teacher may refuse to allow the student to carry out the experiment.
6. A student may leave the laboratory with permission for very short periods of time only if his or her partner is tending to the experimental set-up.
7. During laboratory sessions all students should remain, as much as possible, near their workstations, and work in a quiet non-disruptive fashion.
8. Classroom or laboratory assignments or reports must be submitted on or before the deadline dates.
9. Students are expected to write all tests, quizzes and final exams at the times scheduled by the teacher or the College. Teachers are not obliged to re-schedule tests, quizzes or examinations to satisfy individual student preferences.
10. There will be no make-up classroom tests or quizzes. In such cases where a student misses a test or quiz with valid reason, the teacher may arrange an alternative marking scheme for the student in question.
11. Students are responsible for all course material and announcements missed when they take an intensive course or for any other reason.
12. Your teacher has the right to ensure order and safety in the classroom and lab, and will take appropriate action to remedy any situation which arises because of non-compliance with the above regulations. Dismissal from the classroom or the laboratory is a legitimate option on the part of the teacher. The student will then be required to meet with the Chairman of the Department of Chemistry & Chemical Technology who will decide on any future action to be taken.
13. The use of cell phones and unauthorized electronic devices are forbidden in the classroom and laboratory.

USEFUL LINKS

https://www.dawsoncollege.qc.ca
The Dawson College website gives access to several useful information like the academic calendar, the library database or class cancellations.

https://dawsoncollege.omnivox.ca
The Omnivox platform centralized several computer services available at Dawson. The student can access LEA to get course documents, communicate with their teacher or check their grade online.

https://www.dawsoncollege.qc.ca/programs/science-medical-studies-and-engineering/science
A complete description of the objectives and standards of this course is provided in this document describing the Dawson College Science Program.

https://www.dawsoncollege.qc.ca/chemistry/previous-final-exams/
Previous Final Examinations with their solutions from the Chemistry Department.

https://www.youtube.com/playlist?list=PL0qww-JVWwG4WcSfi-W2Nlxb7wAYSrBFZ
Playlist of all the NYA Pre-Lab experimental videos can be found on the Dawson College Chemistry Department YouTube Channel.

https://www.dawsoncollege.qc.ca/governance/institutional-student-evaluation-policy/
The Dawson College Institutional Student Evaluation Policy (ISEP) is designed to promote equitable and effective evaluation of student learning.

COURSE CONTENT & SCHEDULE (Reference: Zumdahl / Zumdahl, 11th Ed)

Chapter 1: CHEMICAL FOUNDATIONS

Section		Suggested problems
1.5	Significant Figures and Calculations	34, 38, 42, 44, 54, 66
	Appendix 2 NYA Lab manual p. 97-98	NYA Lab manual p. 99
	Consideration of Environmental Issues	Package

(Laboratories and exams will include grades for the proper use of significant figures)

Chapter 2: ATOMS, MOLECULES, AND IONS

Section		Suggested problems
2.5	The Modern View of Atomic Structure: An introduction	71, 75, 77, 79, 81
2.6	Molecules and Ions	83
2.7	An Introduction to the Periodic Table	65
2.8	Naming Simple Compounds	85, 87, 89, 93, 95, 97, 99, 119

Chapter 3: STOICHIOMETRY

Section		Suggested problems
3.2	Atomic Masses	39, 46
3.3	The Mole	47, 49, 54, 55, 59, 65, 71, 73, 76, 77
3.4	Molar Mass	
3.6	Percent Composition of Compounds	75, 79, 85
3.7	Determining the Formula of a Compound	87, 89, 93, 95, 97, 99, 105
3.8	Chemical Equations	111, 112
3.9	Balancing Chemical Equations	
3.10	Stoichiometric Calculations: Amounts of Reactants and Products	119, 121, 123, 127
3.11	The concept of Limiting Reagent	133, 137, 142

Chapter 5: GASES

Section		Suggested problems
5.4	Gas Stoichiometry	73, 75, 77, 81, 83, 87
5.5	Dalton's Law of Partial Pressures	95, 109

Chapter 4: TYPES OF CHEMICAL REACTIONS

Section		Suggested problems
4.2	The Nature of Aqueous Solutions: Strong and Weak Electrolytes	4, 23, 33, 37
4.3	The Composition of Solutions	11, 12, 14, 39, 41, 43, 45, 51, 53
4.4	Types of Chemical Reactions	
4.5	Precipitation Reactions	59, 61
4.6	Describing Reactions in Solution	65, 69
4.7	Stoichiometry of Precipitation Reactions	73
4.8	Acid-Base Reactions	83, 85, 89, 91, 96
4.9	Oxidation-Reduction Reactions	31, 97, 99, 103
4.10	Balancing Oxidation-Reduction Equations	105, 107, (Chapter 18: 21, 22, 23, 25)

Chapter 7: ATOMIC STRUCTURE AND PERIODICITY

Section		Suggested problems
7.1	Electromagnetic Radiation	51, 53, 57, 159
7.2	The Nature of Matter	59, 62, 65, 67
7.3 – 7.4	The Atomic Spectrum of Hydrogen – The Bohr model	69, 71, 73, 78
7.5	The Quantum Mechanical Model of the Atom	
7.6	Quantum Numbers	81, 85
7.7	Orbital Shapes and Energies	87, 91
7.8	Electron Spin and the Pauli Principle	93
7.9	Polyelectronic Atoms	97, 103, 107, 111, 113
7.11	The Aufbau Principle and the Periodic Table	
7.12	Periodic Trends in Atomic Properties	119, 123, 133, 135

Chapter 8: BONDING GENERAL CONCEPTS

Section		Suggested problems
8.1	Types of Chemical Bonds	
8.2	Electronegativity	33
8.3	Bond Polarity and Dipole Moments	35, 39, 45
8.4	Ions: Electron Configurations and Sizes	53, 55, 57, 59, 63
8.6	Partial Ionic Character of Covalent Bonds	
8.7	The Covalent Chemical Bond: A Model	
8.9	The Localized Electron Bonding Model	
8.10	Lewis Structures	93, 97
8.11	Exceptions to the Octet Rule	101
8.12	Resonance	115, 119
8.13	Molecular Structure: The VSEPR Model	133, 134, 135, 143, 145, 146, 147
	Simple Polymers	

Chapter 9: COVALENT BONDING

Section		Suggested problems
9.1	Hybridization and the Localized Electron Model	27, 29, 31, 37, 39, 40, 41, 47, 48, 49, 53, 54, 55, 75

Chapter 10: LIQUIDS AND SOLIDS

Section		Suggested problems
10.2	Intermolecular Forces	45, 49, 55, 56, 57, 58
10.10	Phase Diagrams	105, 107, 127, 129

Chapter 6: THERMOCHEMISTRY

Section		Suggested problems
6.2	Enthalpy and Calorimetry	71, 73, 75
6.3	Hess's Law	83, 87, 89
6.4	Standard Enthalpies of Formation	91, 97, 99, 101, 103
8.8	Covalent Bond Energies and Chemical Reactions	(Chap. 8) 79, 81, 83, 85, 86

DAWSON COLLEGE

DEPARTMENT OF CHEMISTRY & CHEMICAL TECHNOLOGY
LABORATORY SCHEDULE: Winter 2026
202-SN1-RE General Chemistry

Instructor: _____ Daniel BARIL _____ Lab section: _____13 – 14 _____

week	Date	Experiment/Activity Title	Report
1	Jan. 23	Check in / Laboratory Safety / Green Chemistry	
2	Jan. 30	Significant Figures	
3	Feb. 6	Excel workshop	
4	Feb. 13	Stoichiometry	☺
5	Feb. 20	Solution Stoichiometry	☺
6	Feb. 27	Molar Volume of a Gas	Formal
7	March 6	Chemical Reactions	☺
8	March 13	Problem Solving	
	March 20	Study Break – no lab	
9	March 27	Identification of Anions and Cations	☺
10	April 3	Atomic Spectra	Formal
11	April 10	Problem solving	
12	April 17	Volumetric Analysis of Ascorbic Acid (Vitamin C)	☺
13	April 24	Chemical Bonding and mol. shape: VSEPR Theory / Polymer	☺
14	May 1st	Melting Points	☺
15	May 8	Calorimetry / Check out	☺
16	May 15	No lab	

☺ **:** Experiments that do not require a full lab report. Students only have to submit a complete data sheet with sample calculations and answer to the questions. Additional submissions may be required by your instructor.

Formal: Formal lab report (Intro, calculations, conclusion, answer to questions, see your lab instructor)

Noncompliance to any of the following safety regulation will result in expulsion from the lab:

- Safety glasses and lab coat must be worn in the laboratory at all times.
- No eating or drinking (not even water from a bottle) is permitted at any time in the laboratory.
- Keep your personal belonging (bag, coat, etc.) out of the working area.
- Report any accident, even minor, to your instructor.

RELIGIOUS OBSERVANCE FORM

Students observing religious holidays must inform each of their teachers, in writing, of the specific dates as soon as possible, but no later than the end of the second week of classes. This applies both to the semester or term, as well as to any final examination period. As prescribed in the ISEP Policy on Religious Observances. (ISEP Section IV-D).

Your teacher will inform you of any modifications to planned course activities resulting from the teacher's own religious commitments.

Name of the student: _____

Student number: _____

Course: 202-SN1-RE (General Chemistry)

Section (circle one): 13 or 14

Teacher: Daniel Baril

Date of Holiday	Description of the Holiday