

Applied Science & Management Division

CHEM 110

3 Credit Course

Fall, 2019



COURSE OUTLINE

CHEM 110

THE STRUCTURE OF MATTER

3 CREDITS

PREPARED BY: Kailey Wright, Instructor

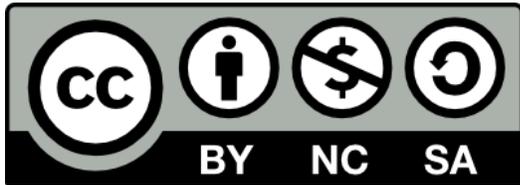
APPROVED BY: Name, Title

DATE: June 5, 2019

DATE: Click or tap to enter a date

APPROVED BY ACADEMIC COUNCIL: Click or tap to enter a date

RENEWED BY ACADEMIC COUNCIL: Click or tap to enter a date



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THE STRUCTURE OF MATTER

INSTRUCTOR: Kailey Wright

CLASSROOM: A2601 / A2803

OFFICE LOCATION: A2410

DATES: Sept. 4 - Dec. 6, 2019

OFFICE HOURS: Mon/Wed 12:00-2:00pm

DAY & TIME:

LECTURES: Mon & Wed 10am - 12pm

E-MAIL: kwright@yukoncollege.yk.ca

LABS: Tues 2:30 - 5:25pm

COURSE DESCRIPTION

This course covers both the common practical aspects of chemistry as well as the theoretical principles that describe this science. Topics of study include the structure of the atom, electron configuration, the nature of chemical bonding and a look at liquids, solids and gases at a molecular level. Other topics of study include reaction stoichiometry and an introduction to organic chemistry and biochemistry. Lab sessions illustrate and reinforce most of the topics presented in the lectures.

PREREQUISITES

Chemistry 11 (CHEM 050). Chemistry 12 (CHEM 060) is strongly recommended. Mathematics 12 (MATH 060) is co-requisite.

Students are expected to come to this course with an understanding of basic nomenclature (chemical naming and formula writing), stoichiometry (equation balancing and chemical calculations) and simple atomic structure. This material will be briefly reviewed during the first week of class. If you feel a bit rusty on these subjects you are strongly advised to see the instructor prior to the start of the course.

EQUIVALENCY OR TRANSFERABILITY

Yukon College CHEM 110(3):

SFU	Chem 121 (3) - Q/B-Sci	UAF	Chem 105X (3)
UAS	Chem 105 (3)	URegina	Chem 102 (3)
UNBC	Chem 100(3) + Chem 120(1)	TRU	Chem 1100 (3)

Yukon College CHEM 110(3) + CHEM 111(3):

UVic	Chem 101 (1.5 units) + Chem 102 (1.5 units)
UBC	Chem 111(4) + Chem 123 (4)

See <http://bctransferguide.ca/> for a complete up to date list of transfers within British Columbia and <http://alis.alberta.ca/ps/tsp/ta/tbi/onlineSearch.html> for information

on transfers within Alberta.

On the strength of these transfer agreements the course will likely transfer to many other universities with which we do not maintain formal transfer agreements. For more information about transferability contact the Applied Science office.

LEARNING OUTCOMES

Upon successful completion of this course, students will:

- have developed critical thinking skills.
- be able to understand and apply fundamental chemistry concepts.
- have developed basic laboratory skills.

COURSE FORMAT

Lectures: Three hours per week.

Labs: Three hours per week.

Tutorials: One hour per week, incorporated into the lecture times.

ASSESSMENTS

Attendance - While attendance is not graded, it is strongly recommended. There is a strong positive correlation between attendance and academic performance.

Assignments - There will be *at least* 10 assignments due on an approximately weekly basis. The best 8 out of 10 assignments will count toward the final grade. Assignments will involve a variety of questions or problems related to the course material. You will have at least one week to complete each assignment. Late assignments will not be accepted under any circumstances (receiving a mark of 0).

Tests and Examinations - There will be two 60-minute term tests (October 2, 2019 and November 6, 2019) held during scheduled class time. Each test is worth 15% of the final grade. The final examination, worth 30% of the final grade, will take place on December 16 at 9:00 am. The exam venue will be announced as soon as it is known.

Laboratory Component - As a whole, the laboratory component is worth 30% of the final grade. This will be based on lab performance (10%), pre-lab questions (10%), lab quizzes (5%), and lab reports (75%). The specific evaluation criteria for the lab are detailed in the lab manual.

EVALUATION:

Term Test 1 (60 minutes)	15%
Term Test 2 (60 minutes)	15%
Assignments	10%
Exam (3 hours)	30%
Laboratory	30%
Total	100%

REQUIRED TEXTBOOKS AND MATERIALS

As a step to making education more affordable, we will be using LibreText and BC Open Textbooks as our textbooks. Some copies of traditional textbooks will be placed on reserve in the library.

The Laboratory Manual for Chemistry 110 will be provided. You will need to provide your own notebook for use as a Lab Notebook (more information will be provided in the first lab session).

ACADEMIC AND STUDENT CONDUCT

Information on academic standing and student rights and responsibilities can be found in the current Academic Regulations that are posted on the Student Services/ Admissions & Registration web page.

PLAGIARISM

Plagiarism is a serious academic offence. Plagiarism occurs when a student submits work for credit that includes the words, ideas, or data of others, without citing the source from which the material is taken. Plagiarism can be the deliberate use of a whole piece of work, but more frequently it occurs when students fail to acknowledge and document sources from which they have taken material according to an accepted manuscript style (e.g., APA, CSE, MLA, etc.). Students may use sources which are public domain or licensed under Creative Commons; however, academic documentation standards must still be followed. Except with explicit permission of the instructor, resubmitting work which has previously received credit is also considered plagiarism. Students who plagiarize material for assignments will receive a mark of zero (F) on the assignment and may fail the course. Plagiarism may also result in dismissal from a program of study or the College.

YUKON FIRST NATIONS CORE COMPETENCY

Yukon College recognizes that a greater understanding and awareness of Yukon First Nations history, culture and journey towards self-determination will help to build positive relationships among all Yukon citizens. As a result, to graduate from ANY Yukon College program, you will be required to achieve core competency in knowledge of Yukon First Nations. For details, please see www.yukoncollege.yk.ca/yfnccr.

ACADEMIC ACCOMMODATION

Reasonable accommodations are available for students requiring an academic accommodation to fully participate in this class. These accommodations are available for students with a documented disability, chronic condition or any other grounds specified in section 8.0 of the Yukon College Academic Regulations (available on the Yukon College website). It is the student's responsibility to seek these accommodations. If a student requires an academic accommodation, he/she should contact the Learning Assistance Centre (LAC): lac@yukoncollege.yk.ca.

TOPIC OUTLINE

Week	Unit	Topic
1 2	1	Fundamental Concepts (Review) - Atoms, molecules, compounds, empirical formulas - Measurements, moles, solution concentration and dilution - Chemical equations, stoichiometry, yields
2 3	2	Atoms and Light - Absorption and emission spectra - Properties of electrons, quantization and quantum numbers - Shapes of atomic orbitals
4	3	Atomic Energies and Periodicity - Electron configurations - Periodicity of atomic properties - Ions and ionic compounds
4 5	4	Fundamentals of Chemical Bonding - Bond length, electron sharing, polarity - Lewis structures and molecular shapes - Covalent bond properties
6	5	Theories of Chemical Bonding - Localized models, hybridized orbitals, multiple bonds - Molecular orbital theory - Resonance, delocalized π systems
7 8	6	Organic Chemistry Structures - hydrocarbon structures, nomenclature, stereochemistry
8 9	7	Organic Chemistry Reactions - nucleophiles, electrophiles, mechanisms - substitution reactions - elimination reactions - addition reactions
10 11	8	Behaviour of Gases - Ideal gas law, gas mixtures, stoichiometry - Molecular view of gases - Molar mass determination, gas density, rates of movement - Real gases
12 13	9 10	Band Theory of Solids Intermolecular Forces - melting and boiling points - types of forces

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		- properties of liquids
13 14	11	Properties of Solutions - solubility - colligative properties - colloids, suspensions, surfactants

**Specific dates of topic coverage are subject to change. Some topics may not be covered depending on time constraints.*