



Loyola

HIGH SCHOOL

Secondary 5 Chemistry

Ms.Mongeon	e-mail	mongeona@loyola.ca	office hours	Updated weekly, and upon request
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Description:

This course begins with a review of the fundamental concepts of Chemistry previously discussed in secondary 4 Science and Environment (SE), namely chemical bonding, nomenclature, the concept of the mole and stoichiometric calculations. The exploration of new topics, such as the properties of gases, laws of thermodynamics, kinetics and chemical equilibrium will then provide further background knowledge and a more thorough preparation for students who wish to pursue the sciences in higher education. Lab activities highlight hands- on experimental techniques and application of concepts, providing students with many opportunities to hone their critical thinking and problem-solving skills.

In order for students to achieve success and maximize their potential in this course, it is crucial they remain organized in note-taking and disciplined in using class time effectively to complete assigned work.

Expectations:

- **Daily:** be prepared with a binder (dividers recommended), notebook or looseleaf, ruler, calculator and charged Chrome book.
- **Labs:** lab coat and goggles are required for all lab activities. If a student is missing either item, he will not be admitted into the lab. Any missed labs (due to missing materials or an absence) must be rescheduled within 24 hours through our lab technician Mr. Dagher (daghere@loyola.ca)
- **Homework:** complete short homework tasks, which may be checked for completion or collected and marked. If homework is neglected, an appropriate consequence will be determined in consultation with the student.
- **Quizzes/Tests:** be prepared for frequent quizzes by reviewing notes regularly, and 2-3 tests per term.
- **Late Penalty:** respect assignment deadlines or receive a grade penalty of 20% per day.
- **Exam:** Students will write a theory exam in December. In June, students will write both lab and theory exams.

Resources:

- Quantum Chemistry textbook
- Moodle page regularly-**Chemistry Ms. Mongeon**
- Extra help- times updated weekly, additional tutorials upon request

Important Reminder- Lab Reports

- Students generally work in partners, yet the majority of reports are submitted individually. While a student will have the same data as his partner, the remaining sections of his report should clearly reflect his own work. Failure to do so can result in a zero or disciplinary action, as this would be considered cheating.
- All students are therefore encouraged to submit their lab reports **EARLY** for feedback. This provides the student an opportunity to improve his overall understanding and final grade on the report.

Course Breakdown:

Section	Types of Evaluations	Competencies	Weighting Overall Grade
Practical	<ul style="list-style-type: none">• Major lab reports (1 per term)• Minor lab reports (2-4 per term)• Short presentations or assignments **weighted according to complexity**	<ul style="list-style-type: none">• Seeks answers or solutions to scientific or technological problems• Communicates in the languages used in science and technology	40%
Theory	<ul style="list-style-type: none">• Quizzes (10%)• Unit tests (50%)• Exam (30%)• Homework and participation (10%)	<ul style="list-style-type: none">• Makes the most of his knowledge of science and technology• Communicates in the languages used in science and technology	60%

Course Content

TERM 1	TERM 1-2	TERM 2
<p>Scientific Method</p> <ul style="list-style-type: none">● Laboratory report writing <p>Science Techniques</p> <ul style="list-style-type: none">● Review of dimensional analysis, scientific notation● Graphical representation of data● Percent yield and percent error● Significant Figures● Accuracy of measurements and lab equipment <p>Organization of Matter</p> <ul style="list-style-type: none">● Types of bonds (covalent, ionic)● Polyatomic ions● Nomenclature and notation rules● Concept of the mole <p>Chemical Changes</p> <ul style="list-style-type: none">● Types of chemical reactions● Balancing chemical equations● Stoichiometry● Limiting and excess reactants <p>Behavior of Gases</p> <ul style="list-style-type: none">● Measuring gas pressure: manometer● Graham's Law● Boyle's Law● Charles' Law● Gay-Lussack's Law● Combined gas Law● Dalton's Law of partial pressure● Ideal gas Law	<p>Thermochemistry</p> <ul style="list-style-type: none">● Endothermic and exothermic changes● Specific heat capacity● $Q = mcT$● Heat of fusion/vaporization● Interpreting heating curve/diagram● Heat of solution● Heat of neutralization● Thermochemical stoichiometry● Hess's Law <p>Reaction Rates</p> <ul style="list-style-type: none">● Collision Theory● Energy graphs: activation energy● Average rate vs. instantaneous rate● Factors that affect the rate● Determining rate law● Reaction mechanisms (intermediate steps) <p>Chemical Equilibrium</p> <ul style="list-style-type: none">● Static vs dynamic	<p>Le Chatelier's Principle</p> <ul style="list-style-type: none">● Effect of changing concentration, or adding/removing● Effect of changing the pressure● Difference between solids, liquids and gases on equilibrium● Equilibrium constant● ICE table calculations● Reaction Quotient <p>Solubility</p> <ul style="list-style-type: none">● Solubility product K_{sp}● ICE tables with K_{sp}● Solubility rules● Predicting precipitates in reaction● Common ion effect <p>Acids and pH</p> <ul style="list-style-type: none">● Acidity constant● Weak acids vs strong acids● Percent ionization● pH and pOH calculations● titrations of acids and bases