



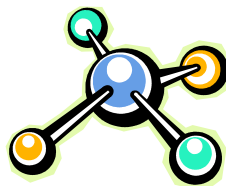
# CHEMISTRY 1000

General Chemistry I

Spring 2023

Dr. Susan Findlay

Review Exercises 1.1 to 1.4



# CHEM 1000 Teaching Team



## Dr. Susan Findlay

BSc Applied Chemistry; University of Guelph  
PhD Organic Chemistry; University of Calgary

Mother of two energetic boys, outdoor enthusiast,  
board game connoisseur and Pokémon Go addict.



### Introductory Chemistry

- CHEM 1000 and 2000

### Organic Chemistry

- CHEM 2500 and CHEM 2600
- CHEM 4000 (Medicinal Chemistry)



# CHEM 1000 Teaching Team



## Wayne Lippa

BEd Science Education/BSc Chemistry;  
University of Lethbridge

Former U of L Teaching Fellow (2012-2013)  
Self-described mediocre disc golf player,  
above-average badminton player and master  
procrastinator

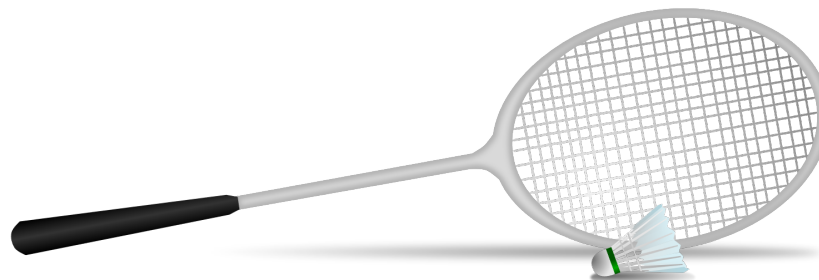
CHEM 1000 Lab Co-ordinator

Analytical Chemistry

- CHEM 2410 and 3410

Physical Chemistry Labs

- CHEM 2740





# Contact Information

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- If you have any questions outside of class/lab, you can reach me:
  - in my office (SA8458) if I'm not teaching
  - via email: [susan.lait@uleth.ca](mailto:susan.lait@uleth.ca)
  - message me on [Campuswire](#)!
  
- Websites you'll need to access:
  - <https://moodle.uleth.ca/> (lab course and lecture course are separate!)
  - <https://campuswire.com/c/GAC78DE63/feed> (for questions, answers, etc.)
  - <https://achieve.macmillanlearning.com/courses/zc2vgc> (for online assignments; free access on desktop computers in University Hall and Anderson Hall computer labs as well as most desktop computers in the University Library; otherwise, \$42US for 6 months or \$64US for paired courses within 1 year)
  - <http://scholar.ulethbridge.ca/susanfindlay> (home of Susan's lecture notes, practice questions, practice tests, etc.)



# Welcome to Chemistry 1000

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- You will need:
  - *Chemistry The Molecular Nature of Matter and Change, Third Canadian Edition* by Silberberg, Amateis, Lavieri & Venkateswaran (or any other good first year chemistry text); this is for studying only – no need to bring it to class!
  - *Lab Manual* (University Bookstore)
  - *Lab Coat* (University Bookstore)
  - *Safety Glasses* (University Bookstore)
  - *Lock* (coats, backpacks, etc. cannot enter lab; use a locker)
  - *Calculator* (WITHOUT wireless communication capability; required for labs and tests; recommended that you bring to lecture as well)



# Welcome to Chemistry 1000

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- What's Chemistry 1000 about?
  - CHEM 1000 is the first half of a full year course in general chemistry. The second half of the course, CHEM 2000, should ideally be taken within one year of completing CHEM 1000. The goal of these courses is to introduce you to university-level chemistry and to give you an appreciation for the diversity of the field.
- In order to succeed in Chemistry 1000, you must have completed:
  - Grade 12 Chemistry or equivalent (typically Chemistry 30)
  - Grade 12 Mathematics or equivalent (typically Math 30-1)



# Pre-Requisite Knowledge

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- Chemistry knowledge/skills expected of students entering Chemistry 1000:
  - Stoichiometry (the mole, molar masses, limiting reagents, balancing equations, etc.)
  - Solution chemistry (dilutions, calculating concentration, etc.)
  - Equilibrium, equilibrium constants and Le Châtelier's principle
  - Acid-Base chemistry (simple reactions, calculating pH)
  - Gases (ideal gas law)
  - Thermodynamics (enthalpy, exothermic/endothermic reactions)
  - Subatomic particles (protons, neutrons and electrons)
- Mathematical knowledge/skills expected of students entering Chemistry 1000:
  - Algebra: rearranging equations (including those with fractions and/or logarithms)
  - Graphically adding and subtracting functions such as waves
  - Use of units and significant figures



# Grade Composition

|                                    | <b>Dates</b>   | <b>Method 1*</b>      | <b>Method 2*</b> |
|------------------------------------|--|-----------------------|------------------|
| Laboratory                         | <i>see laboratory schedule</i>   | 25%                   | 25%              |
| Assignments                        | <i>see next page</i>   | 10%                   | 10%              |
| Midterm Tests<br>(90 minutes each) | Tuesdays at 6:30pm:<br>Feb. 14 <sup>th</sup> and Mar. 21 <sup>st</sup> | 30%<br>(2 @ 15% each) | 0%               |
| Final Exam<br>(3 hours)            | <i>scheduled by Registrar's Office after<br/>Add/Drop</i>              | 35%                   | 65%              |
| <b>Total</b>                       |  | 100%                  | 100%             |

\*Your mark is automatically calculated using both methods, and the higher score is awarded.

**YOU MUST PASS BOTH THE LAB (12.5/25) AND LECTURE (37.5/75)**  
**PORTIONS OF THE COURSE SEPARATELY**  
**IN ORDER TO RECEIVE ANY GRADE OTHER THAN 'F'.**





# Online Assignments (“Achieve”)

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- CHEM 1000 has weekly online assignments accessible at <https://achieve.macmillanlearning.com/courses/zc2vgc>
- If you don't already have a Macmillan account, click on “Create Account” and follow the instructions.
- Macmillan will send you an email to ensure that you are not a spambot. You will need to click a link in it to activate your account.
- Achieve can be accessed for free until January 17<sup>th</sup>. After that, access from desktop computers in the University Hall and Anderson Hall computer labs (and most desktop computers in the library) remains free. Access from elsewhere (or other devices) requires purchase of an access code. 6-month codes are good for 1 course; 12-month codes are good for a pair of linked courses (CHEM 1000/2000 or CHEM 2500/2600).
- ***Assignments are due at 11:59pm every Monday evening. Late penalties are 10% per day but only apply to questions answered after the deadline.***



# Approximate Schedule

| <b>Topic</b>                                  |   | <b>Week</b> |
|---|---|-------------|
| Atomic Structure and Nuclear Chemistry        | Isotopes, their Applications and Mass Spectrometry<br>Stability of Nuclei<br>Nuclear Decay and other Nuclear Reactions<br>First Order Kinetics<br>Light and Spectroscopy<br>Electrons, Quantum Numbers and Electron Configurations<br>The Periodic Table and Periodic Trends  | 1 – 6       |
| The Chemical Alphabet (Elements of Chemistry) | Chemistry of the Elements (a Survey of the Periodic Table by Group – includes Production, Reactions, Physical and Chemical Properties, etc.)<br>Lewis Structures, VSEPR and Polarity<br>Intermolecular Forces, Kinetic Molecular Theory and Gases<br>Acids and Bases: Arrhenius, Brønsted and Lewis<br>Aqua Complexes, Acidity and Solubility<br>Nomenclature and Stoichiometry | 6 – 11      |
| Colour in Chemistry (Co-ordination Chemistry) | Ligands and Co-ordination Complexes<br>Crystal Field Splitting<br>Colour and Spectroscopy   | 12          |



# What is Chemistry?

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- Often defined as “the study of matter”, chemistry answers the questions:
  - “What is a substance made of?”
  - “How was it made?”
  - “How will it interact with other substances?”
- Often termed “the central science”, the study of chemistry is vital to a wide variety of fields:
  - Biology
  - Geology
  - Metallurgy
  - Materials Science
  - Forensic Science
  - Medicine and Pharmacy
  - Environmental Science
  - Food Science and Nutrition
  - Many more...
- Since all matter is made of atoms, we will begin there...