

Year 11 and 12 Chemistry

An intensive one-week course covering the core content of senior Chemistry.

Course Overview

Year 11 and 12 Chemistry is an intensive one-week program designed for motivated students preparing for, or currently studying, Year 11 and 12 Chemistry. It offers a comprehensive and logically structured overview of foundational Chemistry across NSW, ACT, and IB curricula, building the conceptual framework that makes senior Chemistry make sense. Year 11 and 12 Chemistry has been designed with the goal of teaching the subject in a logical, clear, and comprehensive way.

Most students first encounter chemistry as a collection of disconnected facts—memorise this formula, balance that equation, learn these definitions. This course takes a different approach. Starting from atomic structure and working systematically through bonding, molecular geometry, and quantitative analysis, students see how each concept depends on what came before. The periodic table stops being a poster on the wall and becomes a tool that predicts behaviour. Chemical reactions stop being arbitrary and start following logical patterns. Students develop both conceptual understanding and practical problem-solving skills, learning not just what happens but why.

Year 11 and 12 Chemistry also lays the groundwork for Chemistry II, which extends into equilibrium, thermodynamics, acids and bases, and electrochemistry. Students receive a detailed course book with explanations, practice questions, and worksheets—an excellent reference throughout Years 11, 12, and beyond. We've invested heavily in this program and believe it will change how students view Chemistry—and Science more broadly.

Course Delivery:

- Lecture-style classrooms
- Small group tutorials
- Workbooks and additional worksheets
- Examinations

Target students:

- Year 11 Students
- Year 12 Students
- Advanced Year 10 Students

Key Course Information

Length: 40 Hours total (5 days)
Dates: Monday 11th to Friday 15th January
Times: 9am to 5pm daily
Location: Wise Minds Overflow
Positions: 20 students (First in best dressed)
Price: $800 for the entire week (Including GST)
Can be paid in two equal instalments

Relevant School Subjects

- 10, 11 and 12 Chemistry for the ACT, NSW or IB.
- Covers the core content of Year 11 and 12 Chemistry syllabi.

Enrolment:

Please email the course director below expressing your interest and request to be enrolled in the course. Please note a deposit will be required to confirm your slot.

Course Director: Rhys@WiseMindsTutoring.com.au (Ph: 0489089919)
Course Convenor: Lachlan@WiseMindsTutoring.com.au (Ph: 0489071014)

Course Overview

1. The Nature of Matter

1. Classification of matter: elements, compounds, mixtures
2. States of matter and kinetic molecular theory
3. Separation techniques
4. Physical properties for classification

2. Atomic Structure

1. Subatomic particles and nuclear model
2. Historical development of atomic models
3. Isotopes and relative atomic mass
4. Mass spectrometry

3. Electron Configurations

1. Energy levels and sublevels
2. Aufbau principle, Hund's rule, Pauli exclusion principle
3. Electron shell and orbital diagrams
4. Atomic emission spectra and flame tests

4. The Periodic Table

1. Organisation and structure
2. Periodic trends: atomic radius, ionisation energy, electronegativity
3. Group properties: alkali metals, halogens, noble gases
4. Transition metals

5. Chemical Bonding

1. Ionic bonding and lattice structures
2. Metallic bonding
3. Covalent bonding: Lewis structures, single, double, triple bonds
4. Coordinate covalent bonds

6. Molecular Structure

1. VSEPR theory and molecular geometry
2. Bond polarity and molecular polarity
3. Intermolecular forces
4. Properties of water

7. Structure and Properties

1. Ionic compounds
2. Metallic substances and alloys
3. Covalent molecular substances
4. Covalent network structures and carbon allotropes

8. Quantitative Chemistry

1. The mole concept and Avogadro's constant
2. Molar mass calculations
3. Empirical and molecular formulae
4. Percentage composition

9. Stoichiometry

1. Balancing chemical equations
2. Mole ratios and mass calculations
3. Limiting reagents and percentage yield
4. Atom economy

10. Solutions and Concentration

1. Molarity and dilutions
2. Solubility rules
3. Volumetric analysis and titrations

11. Gas Laws

1. Kinetic molecular theory of gases
2. Boyle's, Charles's, and Gay-Lussac's Laws
3. Ideal Gas Law
4. Gas stoichiometry

12. Types of Chemical Reactions

1. Synthesis, decomposition, displacement reactions
2. Combustion reactions
3. Precipitation and acid-base reactions
4. Predicting products