



Chemistry

A-level Course Guide

The Alchemist Discovering Phosphorus is a painting by Joseph Wright originally completed in 1771 then reworked in 1795. The picture shows the alchemist trying to produce the elusive Philosopher's stone, which could turn ordinary metal into gold, but instead, to his amazement, he discovers phosphorus. He also gave a very favourable impression of the actual process which involves the reduction by boiling of urine.

What is chemistry?

Chemistry is the science that describes matter - its properties, the changes it undergoes, and the energy changes that accompany those processes.

There are many branches of chemistry or chemistry disciplines. The five main branches are considered to be organic chemistry, inorganic chemistry, analytical chemistry, physical chemistry, and biochemistry.

Why should I study chemistry?

Some reasons to study chemistry:

- it helps you to be analytical and logical
- you can apply chemistry to lots of different subjects, so it gives you a great foundation
- it's a core subject that enables you to cross over to the other core sciences or venture into biochemistry, geochemistry, chemical engineering or physical chemistry
- it can lead to a wide variety of careers
- you just love chemistry.

What can I do with an A-level in chemistry?

Chemistry-based jobs are interesting and rewarding with many opportunities available in research, education, field work and other industries you might not have thought of. Lots of trained chemists work outside traditional chemistry careers because chemistry is all around us, and the skills you develop from a chemistry qualification can be applied to many areas of expertise.

Why choose Notre Dame to study chemistry?

- we're a group of specialist teachers committed to our work and students
- we draw from a large body of professional and industrial experience
- we have a proven track record in supporting students to achieve places at Russell Group universities and to study competitively sought after courses such as Medicine, Veterinary Science and Dentistry.
- a strong history of practical chemistry that is supported by modern, well equipped laboratories and specialist technical support

Do I need to be good at maths to study A-level chemistry?

Like all science disciplines, chemistry uses mathematics to describe the world around us. A strong foundation in mathematics at GCSE is key to successfully studying chemistry at A-level. For this reason, we require students to hold a grade 6 or above in Mathematics at GCSE. We also encourage students studying chemistry to combine it with A-level mathematics as experience has shown this to be advantageous.

What will I study?

At Notre Dame we follow OCR's 'Chemistry A' specification. Details of the specification can be found on OCR's website. The course is structured using six modules which seek to develop the knowledge and skills acquired at GCSE:

Module 1: Development of practical skills in chemistry

- Practical skills assessed in a written examination
- Practical skills assessed in the practical endorsement

Module 2: Foundations in chemistry

- Atoms, compounds, molecules and equations
- Amount of substance
- Acid–base and redox reactions
- Electrons, bonding and structure

Module 3: Periodic table and energy

- The periodic table and periodicity
- Group 2 and the halogens
- Qualitative analysis
- Enthalpy changes
- Reaction rates and equilibrium (qualitative)

Module 4: Core organic chemistry

- Basic concepts
- Hydrocarbons
- Alcohols and haloalkanes
- Organic synthesis
- Analytical techniques (IR and MS)

Module 5: Physical chemistry and transition elements

- Reaction rates and equilibrium (quantitative)
- pH and buffers
- Enthalpy, entropy and free energy
- Redox and electrode potentials
- Transition elements

Module 6: Organic chemistry and analysis

- Aromatic compounds
- Carbonyl compounds
- Carboxylic acids and esters
- Nitrogen compounds
- Polymers
- Organic synthesis
- Chromatography and spectroscopy (NMR)

How will I be assessed?

The course is assessed in two ways. The first is the overall grade (A*-E) which is determined by three exams that are taken at the end of the second year of study. The second form of assessment is the Practical Endorsement. This is reported alongside a student's overall grade and is recorded as a pass/fail.

Content Overview	Assessment Overview	
<p>Content is split into six teaching modules:</p> <ul style="list-style-type: none">Module 1 – Development of practical skills in chemistryModule 2 – Foundations in chemistryModule 3 – Periodic table and energyModule 4 – Core organic chemistryModule 5 – Physical chemistry and transition elementsModule 6 – Organic chemistry and analysis <p>Component 01 assesses content from modules 1, 2, 3 and 5.</p> <p>Component 02 assesses content from modules 1, 2, 4 and 6.</p> <p>Component 03 assesses content from all modules (1 to 6).</p>	<p>Periodic table, elements and physical chemistry (01)</p> <p>100 marks</p> <p>2 hours 15 minutes written paper</p>	<p>37%</p> <p>of total A level</p>
	<p>Synthesis and analytical techniques (02)</p> <p>100 marks</p> <p>2 hours 15 minutes written paper</p>	<p>37%</p> <p>of total A level</p>
	<p>Unified chemistry (03)</p> <p>70 marks</p> <p>1 hour 30 minutes written paper</p>	<p>26%</p> <p>of total A level</p>
	<p>Practical Endorsement in chemistry (04)</p> <p>(non exam assessment)</p>	<p>Reported separately</p> <p>(see Section 5)</p>

Useful books, websites and contacts

- Recommended textbooks:
 - A level Chemistry for OCR A* by Rob Ritchie and Dave Gent; published by Oxford University Press (ISBN: 9780198351979)
 - Calculations in AS/A Level Chemistry* by Jim Clark; published by Longman (ISBN 0582411270)
- Full details of the course are available at:
<https://www.ocr.org.uk/qualifications/as-and-a-level/chemistry-a-h032-h432-from-2015/>
- GCSE to A-level transition pack:
<https://bit.ly/gcsetoaleveltransitionpack>
- Mr Moore (Head of Chemistry): cmoore@ndhs.org.uk