



Chemistry

At Barr's Hill we are committed to ensuring science students receive top quality teaching and learning experiences. Students will be taught by experienced members of staff who are passionate about their subject. Students have the opportunity to learn new content but also to complete a number of core practicals to gain a practical endorsement. Alongside the course they will have opportunities and experiences to develop skills that will support them with their future aspirations.

Entry Requirements

To take A Level Chemistry you need:

A grade 6 in triple Chemistry OR A grade 66 in combined Science AND A grade 6 in Maths

Topics covered

Year 1 (AS-level):

- Topic 1: Atomic Structure and the Periodic Table
- Topic 2: Bonding and Structure
- Topic 3: Redox I
- Topic 4: Inorganic Chemistry and the Periodic Table
- Topic 5: Formulae, Equations and Amounts of Substance
- Topic 6: Organic Chemistry I
- Topic 7: Modern Analytical Techniques I
- Topic 8: Energetics I
- Topic 9: Kinetics I
- Topic 10: Equilibrium I

Year 2 (A-level):

- Topic 11: Equilibrium II
- Topic 12: Acid-base Equilibria
- Topic 13: Energetics II
- Topic 14: Redox II
- Topic 15: Transition Metals
- Topic 16: Kinetics II
- Topic 17: Organic Chemistry II
- Topic 18: Organic Chemistry III
- Topic 19: Modern Analytical Techniques II

Skills you will develop on the course

Throughout this course you will have the opportunity to develop the following skills:

- Confidence in carrying out and evaluating practicals
- Gaining an understanding of the ethical implications in science
- Debating controversial topics
- Critiquing of scientific articles

Assessment

There are three external exams sat in May/June at the end of year 13 and 16 core practicals internally assessed throughout the two years.

The external exams are:

- Paper 1: Advanced Inorganic and Physical Chemistry (30%)
- Paper 2: Advanced Organic and Physical Chemistry (30%)
- Paper 3: General and Practical Principles in Chemistry (40%)

Educational trips, visits and wider experiences

We commit to organising visits for all students to Warwick University where students will gain an insight into life as a Chemistry graduate, meeting university students and lecturers. Students can apply to become Chemistry Student Ambassadors, where they can gain leadership skills and be involved with the organising and delivery of science clubs across all age ranges at Barr's Hill School. In the spring term, we participate in the Chemistry Olympiad International Competition, competing against chemistry students worldwide. For eligible students there is the opportunity to do a Nuffield Research Placement over the summer between year 12 and year 13. We attend a series of lectures at the University of Birmingham, which are currently online, where students can learn about the wider aspects and application of Chemistry outside of the curriculum and the current worldwide Chemistry topics being discussed. We will hopefully also be able to arrange a trip to industry, where students can see Chemistry in action. Students will be given the opportunity to do research projects in chemistry and gain the silver and gold CREST Award, which is internationally acknowledged.

What type of students will do well on this course?

To do well on this course you need to be passionate about chemistry, dedicated, good time management and confident to seek support if necessary.

For more information contact:

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Post-School Progression Opportunities

University	Entry requirements	Other similar courses offered
University of Birmingham Chemistry BSc	ABB to include A level Chemistry. Minimum Mathematics requirement GCSE grade 7.	Chemistry MSci Chemistry with Industrial Experience MSci Chemistry with Study Abroad MSci Chemistry with a Modern Language BSc/MSci Chemistry with Medicinal Chemistry and Drug Discovery BSc/MSci Chemistry with Business Management BSc/MSci
University of Warwick Chemistry BSc	AAB to include Chemistry and one of the following: Mathematics, Further Mathematics, Physics, Biology, Geology, Statistics or Computer Science.	Chemistry MChem Chemistry with Industrial Placement MChem Chemistry with International Placement MChem Chemistry with Medicinal Chemistry BSc/MChem Biochemistry BSc/MBio Biochemistry with Intercalated Year BSc/MBio
Oxford University Chemistry MChem	A*A*A (with both A*'s in science subjects and/or Maths)	Biochemistry Biomedical Sciences Earth Sciences Materials Science
University of Lincoln Chemistry BSc	BBC, to include a grade B in Chemistry	Biomedical Science BSc Chemistry MChem Chemistry for drug discovery and development BSc/MChem Chemistry with Education BSc/MChem Chemistry with Mathematics BSc/MChem Biochemistry BSc/MChem Forensic Chemistry BSc/MChem

Career Opportunities

Analytical Chemist

What would I do?

- analyse samples from various sources to
- use analytical techniques and instrumentation, such as gas and high-performance liquid chromatography (HPLC), ion chromatography, electrochromatography and spectroscopy (infrared and ultraviolet, amongst others)
- interpret data and meet strict guidelines on documentation when recording data
- report scientific results
- develop techniques for the analysis of drug products and chemicals
- liaise with customers, staff and suppliers

Salary: Starting: £18,500

UK average: £25,000 - £40,000.

Routes in: Bachelor's degree in Chemistry

Biotechnologist

What would I do?

- create, conduct and monitor experiments using live organisms or biomolecular processes in a laboratory setting to solve problems, improve processes and develop new products
- use scientific knowledge to follow different methodologies to achieve results
- perform data analysis on your experiments and interpret findings to support scientific investigations
- record and disseminate results accurately in reports and via presentations
- set up, maintain and operate standard laboratory equipment and computers

Salary: Starting: £20,000

UK average: £25,000 - £50,000

Routes in: Bachelor's degree in Chemistry or degree apprenticeship

Chemical Engineer

What would I do?

- work closely with process chemists and control engineers to ensure the process plant is set up to provide maximum output levels and efficient running of the production facility
- design plant and equipment configuration so that they can be readily adapted to suit the product range and the process technologies involved, taking environmental and economic aspects into account
- set up scale-up and scale-down processes, including making appropriate changes, to equipment design and configuration
- assess options for plant expansion or reconfiguration by developing and testing process simulation models
- design, install and commission new production plants, including monitoring developments and troubleshooting
- optimise production by analysing processes and compiling debottleneck studies
- research new products from trial through to commercialisation and improve product lines.

Salary: Starting: £28,600

UK average: £30,000, - £54,000

Routes in: Bachelor's degree in Chemical Engineering