Anglo-Chinese School (Independent)

Chemistry Department (first examination 2025)

Chemistry is an experimental science that combines academic study with the acquisition of practical and investigational skills. It is often called the central science, as chemical principles underpin both the physical environment in which we live and all biological systems. Apart from being a subject worthy of study, chemistry is a prerequisite for many higher education courses, such as medicine, biological science, and environmental science, and it serves as a useful preparation for employment. Chemistry is primarily concerned with identifying patterns that help to explain the matter at the microscopic level. This then allows matter's behaviour to be predicted and controlled at a macroscopic level.

The Nature of Science (NOS) is an overarching theme in the new Chemistry syllabus. It is an important component of the program as it explains how science works and helps students understand the natural world. This lays a strong foundation for further work in Chemistry at higher levels, as well as the use of chemical knowledge in other areas.

A good background in science is essential for students offering Chemistry at Higher Level (HL) or Standard Level (SL). Students applying for both SL and HL Chemistry must achieve a good Chemistry grade at the GCE 'O' Level or the Integrated Programme (IP).

Course Content

The subject is available at both higher level (HL) and standard level (SL). All students will spend 110 hours on the theory learning of the core topics, but HL students are required to spend an additional 70 hours on the syllabus content which covers greater details within each of these areas of study. The syllabus content for both HL and SL includes Stoichiometric relationships, Atomic structure, Periodicity and Functional groups, Chemical bonding and structure, Energetics, Kinetics, and Mechanisms.

During the course, SL students will spend 40 hours in the experimental programme and HL students will spend 60 hours. Through practical work, they learn traditional experimentation techniques and the application of technology. These opportunities help them to develop their investigative skills and evaluate the impact of error and uncertainty in scientific inquiry. The scientific investigation emphasises inquiry-based skills and the formal communication of scientific knowledge. The collaborative sciences project extends the development of scientific communication in a collaborative and interdisciplinary context, allowing students to work together.

Skills Development

At the school level, both theory and experiments will be undertaken by all students, which will complement one another naturally, as they do in the wider scientific community. The chemistry course encourages students to develop traditional practical skills and techniques. It also allows students to develop interpersonal skills and digital technology skills, which are essential in 21st century scientific endeavours and are important life-enhancing, transferable skills.

Through this rigorous course, students learn to selectively organize, present, and analyze data to identify patterns, report trends, draw inferences and make predictions. They will also be encouraged to analyze and evaluate hypotheses, research questions and predictions; scientific methods /techniques and procedures; and scientific explanations.

Assessment

The assessment aims to support curricular goals and encourage student learning. There will be no choice in the questions to be answered in either paper.

Assessment	Standard Level	Higher Level
Paper 1 (1 hr 30 min) Section A: Multiple choice questions Section B: Data-based questions (55 marks)	36%	36%
Paper 2 (1 hr 30 min) Short-answer and extended-response questions (50 marks)	44%	44%
Internal Assessment (IA) Individual investigation (24 marks)	20%	20%

The internal assessment (IA) is an important and compulsory component of the course, and it contributes to 20% of the final assessment in both the SL and HL courses. The requirements at SL and HL are the same. The scientific investigation is an open-ended task in which the student gathers and analyses data to answer their research question. The outcome of the scientific investigation will be assessed in the form of 3000 words written report.

University Courses and Careers

Chemistry is a prerequisite for many higher education courses such as medicine, dentistry, pharmacy, life sciences and environmental science, engineering, food science and the oil and gas industry.

Course Content

1.1 Introduction to the particulate nature of matter	4.1 Measuring enthalpy change
1.2 The nuclear atom	4.2 Energy cycles in reactions
1.3 Electronic configurations	4.3 Energy from fuels
1.4 Counting particles by mass: The mole	4.4 Entropy and spontaneity (AHL)
1.5 Ideal gases	5.1 How much? The amount of chemical change
2.1 The ionic model	5.2 How fast? The rate of chemical change
2.2 The covalent model	5.3 How far? The extent of chemical change
2.3 The metallic model	6.1 Proton transfer reactions
2.4 From models to materials	6.2 Electron transfer reactions
3.1 The periodic table: Classification of elements	6.3 Electron sharing reactions
3.2 Functional groups: Classification of organic compounds	6.4 Electron-pair sharing reactions

IA Criteria

Research Design	**Data Analysis**	**Conclusion**	**Evaluation**
Assesses the extent to which the student			
Communicates the purpose and practice of their investigation.	Selects, records, processes and presents the data relevant to the research question.	Answers their research question, with regards to their analysis and the accepted scientific context.	Evaluates the investigation method, data and results and suggests improvements.
6 (25%)	6 (25%)	6 (25%)	6 (25%)

Recommended Textbook (Available at the school bookstore)

For HL Chemistry: **HL Chemistry for the IB Diploma Programme 3rd Edition (Catrin Brown)**
ISBN 9781292427720 (Pearson)

For SL Chemistry: **SL Chemistry for the IB Diploma Programme 3rd Edition (Catrin Brown)**
ISBN 9781292427690 (Pearson)