HIGHER CHEMISTRY

Candidates should have achieved the National 5 Chemistry course or equivalent qualifications and/or experience prior to starting this course.

**Purpose and aims**

This course develops learners’ curiosity, interest and enthusiasm for chemistry in a range of contexts. The skills of scientific inquiry and investigation are developed throughout the course.

Learners develop an appreciation of the impact of chemistry on their everyday lives by applying their knowledge and understanding of chemical concepts in practical situations. The course provides opportunities for candidates to think analytically, creatively and independently, and to make reasoned evaluations. It allows flexibility and personalisation by offering candidates the choice of topic for their assignment.

Learners gain an understanding of chemical bonding and intermolecular forces that allows them to predict the physical properties of materials. They apply a knowledge of functional groups and organic reaction types to solve problems in a range of diverse contexts. Students also learn important chemical concepts used to take a chemical process from the researcher’s bench through to industrial production. The concept of the mole allows the quantities of reagents required to be calculated, and the quantity of products predicted. By studying energy, rates and equilibria, learners can suggest how reaction conditions can be chosen to maximise the profitability of an industrial process. They learn to use analytical chemistry techniques, such as volumetric analysis and chromatography.

Learners develop a range of skills that are valued in the workplace, providing a secure foundation for the study of chemistry in further and higher education. The course also provides a knowledge base that is useful in the study of other sciences.

The course enables students to make their own decisions on issues within a modern society, where scientific knowledge and its applications and implications are constantly developing.

**The course aims to:**

* Develop and apply knowledge and understanding of chemistry
* Develop an understanding of chemistry’s role in scientific issues and relevant applications of chemistry, including the impact these could make in society and the environment
* Develop scientific inquiry and investigative skills
* Develop scientific analytical thinking skills, including scientific evaluation, in a chemistry context
* Develop the use of technology, equipment and materials safely in practical scientific activities, including using risk assessment
* Develop planning skills

Develop problem-solving skills in a chemistry context

* Use and understand scientific literacy to communicate ideas and issues and to make scientifically informed choices
* Develop the knowledge and skills for more advanced learning in chemistry
* Develop skills of independent working

**Who is this course for?**

The course is suitable for candidates who are secure in their attainment of National 5 Chemistry or an equivalent qualification.

The course emphasises practical and experiential learning opportunities, with a strong skills-based approach to learning. It takes account of the needs of all learners, and provides sufficient flexibility to enable candidates to achieve in different ways.

**Course content**

The course content includes the following areas of chemistry:

**Chemical changes and structure**

The topics covered are:

* Periodicity
* Structure and bonding
* Oxidising and reducing agents

**Nature’s chemistry**

The topics covered are:

* Systematic carbon chemistry
* Alcohols
* Carboxylic acids
* Esters
* Fats and oils
* Soaps
* Detergents and emulsions
* Proteins
* Oxidation of food
* Fragrances
* Skin care

**Chemistry in society**

The topics covered are:

* Getting the most from reactants
* Controlling the rate
* Chemical energy
* Equilibria
* Chemical analysis

**Researching chemistry**

The topics covered are:

* Common chemical apparatus
* General practical techniques
* Reporting experimental work

**Skills, knowledge and understanding**

The following provides a broad overview of the subject skills, knowledge and understanding developed in the course:

* Demonstrating knowledge and understanding of chemistry by making accurate statements
* Demonstrating knowledge and understanding of chemistry by describing information, providing explanations and integrating knowledge
* Applying knowledge of chemistry to new situations, analysing information and solving problems
* Planning, designing and safely carrying out experiments/practical investigations to test given hypotheses or to illustrate particular effects
* Carrying out experiments/practical investigation safely, recording detailed observations and collecting data
* Selecting information from a variety of sources
* Presenting information appropriately in a variety of forms
* Processing information (using calculations and units, where appropriate)
* Making predictions and generalisations from evidence/information
* Drawing valid conclusions and giving explanations supported by evidence/justification
* Evaluating experiments/practical investigations and suggesting improvements
* Communicating findings/information effectively

**ASSESSMENT**

The course assessment has three components.

1. Question paper 1:
   * Multiple Choice; 25 marks; time allowed 40 minutes
2. Question paper 2:
   * Extended response; 95 marks; time allowed 2 hours 20 minutes
3. Assignment;
   * 20 marks; time allowed 2 hours.

**PROGRESSION**

* Advanced higher chemistry
* Other qualifications in chemistry or related areas
* Further study, employment and/or training