

**SUBJECT: CHEMISTRY**

**AWARD RECEIVED: ADVANCED HIGHER**

### **ENTRY LEVEL**

Students will normally have Higher Chemistry, preferably at A or B.

Success in this course is very much dependent of learners committing to a significant amount of independent study out with the five timetabled periods.

### **COURSE CONTENT**

The Course is split up into 3 Units, with the Key Areas covered in each outlined below:

#### **Unit 1 - Inorganic and Physical Chemistry**

This Unit covers the Key Areas of:

**Electromagnetic radiation and atomic spectra; Atomic orbitals, electronic configurations and the Periodic Table; Shapes of molecules and polyatomic ions; Transition metals; Chemical equilibrium; Reaction feasibility; Kinetics.**

This Unit develops a knowledge and understanding of the principles and concepts of inorganic and physical chemistry. Learners will discover how electromagnetic radiation is used in atomic spectroscopy to identify elements. They will extend an understanding of the concept of atomic structure by considering atomic orbitals and electronic configuration related to the periodic table. Using electron pair theory, learners will predict the shape of molecules. Learners will gain an understanding of the physical and chemical properties of transition metals and their compounds. Learners will investigate the quantitative component of chemical equilibria. They will develop their understanding of the factors which influence the feasibility of chemical reactions. Learners will progress their understanding of reaction kinetics by exploring the order and mechanisms of chemical reaction.

#### **Unit 2 - Organic Chemistry and Instrumental Analysis**

This Unit covers the Key Areas of:

**Molecular orbitals; Molecular structure; Stereo chemistry; Synthesis; Experimental determination of structure; Pharmaceutical Chemistry.**

This Unit develops a knowledge and understanding of organic chemistry. Learners will research the structure of organic compounds, including aromatics and amines, and draw on this to explain the physical and chemical properties of the compounds. They will consider the key organic reaction types and mechanisms, and link these to the synthesis of organic chemicals. Learners will discover the origin of colour in organic compounds and how elemental analysis and spectroscopic techniques are used to verify chemical structure. They will study the use of medicines in conjunction with the interactions of the drugs.

#### **Unit 3 - Researching Chemistry**

In this Unit, learners will be given the opportunity to gain an understanding of stoichiometric calculations, to develop practical skills and to carry out research in chemistry. Learners will develop the key skills associated with a variety of different practical techniques, including the related calculations. Equipped with the knowledge of chemistry apparatus, techniques and an understanding of concepts, learners will identify, research, plan and safely carry out a chemistry practical investigation of their choice. The Unit will equip learners with the scientific background and skills necessary to analyse scientific articles and use them in order to make informed choices and decisions.

#### **Project**

As part of their Advanced Higher Chemistry Course, students need to carry out a practical Investigation/Project. This could be on any related topic they choose, or it could be on a theme suggested by their teacher. Students will be supported through their Project, but they will also be expected to make progress independently for some of the time. They need to keep a 'log-book' of their on-going work and then produce a Report of their Investigation. The 'log-book' gets checked and marked internally by their teacher and the Report is externally marked by the SQA, which then counts towards their final, overall Grade, along with their Exam score.

## **ASSESSMENT**

To gain an overall Award for this Course, students need to pass the:

- **Unit Assessments** for each of the Units – these are marked internally in school;
- **Course Assessment**, which is marked by the SQA and includes a:

1. **Project** (30 marks)
2. **Exam** (100 marks)

The Course assessment is graded A–D. The grade is determined on the basis of the total mark for all Components of the Course assessment.

## **HOMEWORK**

Homework is an essential part of the course. It helps prepare students for unit tests, prelim and final examinations. Homework will take the form of: the write up of the course lab work; extended answer questions; data handling questions; practise problems; regular revision of all the material covered in the course and preparation of the Investigation Report.

## **TRANSFERABLE SKILLS**

There are many very useful and valuable transferable skills gained by studying Advanced Higher Chemistry, including: researching, ICT, reporting, numeracy, literacy, graphing, investigating, practical experimental skills, analysing, presentation, evaluating, to name a few.

## **PROGRESSION**

There is good progression from this Course on to further study at University as well as providing an excellent advantage to those seeking employment in a wide range of professions.