

## AS/A2 Level Biology (Edexcel)

### What do I need to take the course?

GCSE Combined Science grade B. As well as having a scientific and inquiring mind, you should be interested in some of the social and ethical issues associated with new advances in biological science.

### What will I learn in AS?

You will build on your existing knowledge and learn new concepts in the areas outlined below. You will also develop your laboratory skills and your ability to think analytically. An example of this is the requirement to construct your own hypotheses and outline your findings in a scientific paper.

**Unit 1 Molecules and Cells** - This unit includes cells and organelles, molecules, enzymes, chromosomes, the genetic code and protein synthesis.

**Unit 2 Exchange, Transport and Reproduction** - This unit includes gas exchange in plants and animals, transport in flowering plants and animals, adaptation to the environment, sexual reproduction in plants and animals, placental development and birth in humans.

**Unit 3 Energy and Environment** - This unit includes modes of nutrition, energy flow through ecosystems, recycling of nutrients, energy resources and human influences on the environment.

### Assessment

End of unit exams and a biological investigation.

### What will I learn in A2?

You will further develop your knowledge and understanding particularly of the relationship between facts, principles, and concepts from different areas of biology.

**Unit 4 Respiration and Co-ordination and Option** - This includes respiration, the kidney, the role of hormones, structure and function of the eye, and the nervous system. The option studied will be either food science or health and fitness.

**Unit 5 Genetics, Evolution and Biodiversity** - This includes photosynthesis, classification of animals and plants, population size, conservation, genetics and genetic engineering, and evolution.

**Unit 6 This unit is comprised of two parts:**

- a) an assessed practical investigation
- b) a synoptic section whereby candidates will have to apply principles and concepts from at least two other units of the specification.

### Assessment

You will follow the Edexcel exam specification. Both the AS course and A2 are assessed by exam and by an individual investigation.

### Progression

A Level Biology can lead to a variety of HE courses, including: Biology, Sport Science, Medicine, Nursing, Health Studies, Dietetics, Psychology, Social Care, Environmental Studies and Pharmacology. The AS offers an opportunity to continue with science for those studying arts and humanities. Please note that if you are interested in pursuing Biological Science at University an AS Level in Chemistry would be desirable.

**Contact:** Alex Paton

## AS/A2 Level Chemistry (Edexcel)

### What do I need to take the course?

GCSE Combined Science grade B, GCSE Mathematics grade C. An interest in chemistry, the ability to think scientifically and logically. An interest in investigating chemical reactions, both practically and theoretically.

### What will I learn at AS?

You will build on your existing knowledge at GCSE and study the three main branches of chemistry:- **Physical Chemistry** which deals with the principles behind chemical change, **Inorganic Chemistry** which involves studying the structure and bonding of elements in the periodic table, and **Organic Chemistry** which is about the chemistry of carbon (two million carbon compounds are known!). All three branches of chemistry involve practical work and are studied across three units, which are:-

- Unit 1 Structure Bonding and Main Group Chemistry:** is made up of seven topics and includes atomic structure, structure and bonding and group Chemistry. The two main groups that will be studied in the first term are Group 1 and Group 7. There will be calculations on moles and expansion on writing formulae equations.
- Unit 2 Introductory Organic Chemistry:** is made up of topics on Organic Chemistry, Kinetics and Energetics. Organic chemistry makes up most of this unit, this is the chemistry of carbon which is a vast subject. Students also study industrial chemistry in this unit.
- Unit 3 Laboratory Chemistry 1:** This consists of two parts:
- i) Unit 3A:- Practical coursework which assesses four different skill areas.
  - ii) Unit 3B:- Which is a written exam paper assessing practical knowledge of the AS syllabus. Moles calculations and the practical aspects of organic and inorganic chemistry are tested in this module. Pupils complete short set courseworks in class and are assessed on four skill areas.

### Assessment

End of unit exams and practical coursework. End of unit exams are taken in early January and early June.

### What will I learn at A2?

A2 is an extension of the knowledge gained in AS. Some new aspects are introduced and others are extended. The A2 course is made up of a further 3 units:-

- Unit 4 Periodicity, Quantitative Equilibria and Functional Group Chemistry:** This unit is made up of five topic areas including acid-base equilibria, periodicity and further Organic Chemistry. This unit is an expansion on Unit 2 and Unit 1. Students are given a greater opportunity to apply their knowledge.
- Unit 5 Transition Metals, Quantitative Kinetics and Applied Organic Chemistry:** New aspects such as Redox Equilibria, Transition Metal Chemistry are introduced. Aromatic chemistry, the chemistry of benzene is introduced and reaction mechanisms or how reactions take place is also taught in this unit.
- Unit 6 Laboratory Chemistry II:** This is also made up of two parts:
- i) Unit 6A:- Practical Coursework
  - ii) Unit 6B:- Synoptic paper assessing the overall knowledge gained over the two years.

### Assessment

Both the AS and A2 are assessed by written and practical examinations.

### Progression

A Level Chemistry leads to a range of careers in Science, Engineering, Medicine, Dentistry and many other fields. A Level Chemists are in very high demand!

**Contact:** Sdaqat Jabeen

## AS/A2 Level Physics (Edexcel)

### What do I need to take the course?

GCSE Combined Science grade B. An interest in Physics, the ability to think scientifically and logically and the ability to find enjoyment and excitement in science.

### What will I learn in AS?

You will learn a combination of theoretical ideas that will help you to understand and explain the universe in which we live. You will develop experimental skills that will enable you to test and develop new scientific theories.

**Unit 1 Mechanics and Radioactivity:** This unit leads on from GCSE and covers motion, forces and moments, Newton's Laws, dynamics, momentum, mechanical energy, radioactive decay and the nuclear atom.

**Unit 2 Electricity and Thermal Physics:** This unit includes study of electric current and potential difference, electrical circuits, heating matter, kinetic model of matter, conservation of energy, the first law of thermodynamics and efficiency.

**Unit 3 Topics and Practical Test:** Students study one out of the following four topics:

- Astrophysics
- Solid Materials
- Nuclear and Particle Physics
- Medical Physics

### Assessment

The AS examination consists of two written unit tests, a practical test and a written test on an optional topic.

### What will I learn in A2?

**Unit 4 Waves and Our Universe:** This unit includes circular motion and oscillations, simple harmonic motion, waves, quantum phenomena and expanding universe.

**Unit 5 Fields and Forces:** This unit covers gravitational fields, electric fields, capacitance, magnetic fields and electromagnetic induction.

**Unit 6 Synthesis:** This is a synoptic unit. Synoptic assessment involves the explicit drawing together of knowledge, understanding and skills learned in different parts of the course.

### Assessment at A2

The A2 examination includes, two more written tests, a practical test and a written terminal synoptic exam.

### Progression

As well as Physics at University, Physics A Level can lead to H.E. Courses and careers in Medicine, Computing, Architecture, Music Technology and Engineering.

**Contact:** Ani Taylor