Subject: Biology

A level

Course Overview

A level Biology offers a comprehensive view of the molecules and involved in maintaining living organisms and the technology and techniques used to study them. You will learn about the very foundations of life in biological molecules, building on GCSE knowledge, all the way through to biological systems at the heart of survival and responding to stimuli, and ultimately to the study of modern gene technologies used in cutting edge research. It encourages use of vocabulary and mathematics, intertwined with key scientific knowledge to excel.

How are the courses assessed?

Grades A*-E awarded. The A level course is assessed by three linear exams at the end of year 2:
Paper 1: Year 1 – Units 1-4, Required Practicals 1-6 (35%)
Paper 2: Year 2 – Units 5-8, Required Practicals 7-12 (35%)
Paper 3: Unified Years 1 + 2 – Units 1-8, Required Practicals 1-12, Extended Essay (30%)

Where can A level Biology take me?

Completion of A-Level Biology provides 16-56 UCAS points, depending on grade awarded. Previous students of Biology have gone on to study medicine, dentistry, veterinary sciences, nursing, midwifery, pharmacy, human anatomy and physiology, botany, speech and language therapy, paramedic science, physiotherapy, psychology, and sports sciences! Biology would also be useful for someone looking to engage both mathematical and English skills more broadly.

Case Study

Name: Liz Bonnin

When did you study this subject: 2002-2004

What other subjects did you study with it: Chemistry & Geography.

What do you do now and do you use the course?
After studying Biology and Chemistry, Liz studied Biochemistry at Trinity College, Dublin. She then went on to complete a Masters in wild animal biology with the Royal Veterinary College in London. During this time, she set up a project to study tigers in Nepal, and then went on to become a science and natural history presenter on-screen. She is now a regular feature on BBC programmes such as Operation Snow Tiger, Big Blue Live and Drowning in Plastic, highlighting the ocean's plastic crisis. Without biology, and an interest in the natural world, none of these opportunities would have been possible.

Year Group and Term	Subject Knowledge	Assessment	Curriculum/CIAG Links
Year 12 Term 1	**Biological Molecules:** Students will deepen their GCSE knowledge of biological molecules such as carbohydrates, lipids and proteins, as well as their functions in organisms. Water, ATP and DNA will also be discussed, including the process of DNA replication.	1 x mid-module mini assessment 1 x end of module test All assessments will be made of past exam questions to challenge students and expose them to the level of questioning expected of an A level student.	Links to GCSE content and some cross-curricular chemistry details Provides foundations of knowledge from which the next two years build on
Year 12 Term 2	**Cells** Students begin learning module 2 with the structure of cells and the different types of microscopes used to study them. Students will develop understanding of how substances transport across membranes and practice their lab skills during required practicals	1 x tracking point assessment 2 x required practicals Ongoing required practicals will be submitted online as part of an e-portfolio	Lab skills for careers – Microscopy, producing solutions, planning and completing investigations, data analysis

Year 12 Term 3	**Cells** Students will continue completing required practicals during term 3, as well as learning about immunity, the immune response, population immunity and HIV. They will also learn about how HIV and other conditions such as pregnancy are tested for using monoclonal antibodies	1 x required practical 1 x end of unit assessment	Lab skills for careers – Controlling variables, colorimetry, drawing graphs from data Role of healthcare workers in HIV screening and pregnancy testing
Year 12 Term 4	**Exchange Systems** Students will learn about how organisms such as humans, fish and insects exchange substances with their environment. Gas exchange, ventilation and digestion are discussed in detail. Focus is also on human circulation and mass transport of substances such as water and sugars in the phloem	1 x required practical 1 x mid-module mini assessment 1 x end of module assessment	Sports therapists – students undertake investigations into the effect of exercise on heart rate. Statistical analysis of results Cardiologists – Students are able to interpret ECGs and Wigger's Diagram of pressure and volume in heart chambers
Year 12 Term 5	**Genomes & Biodiversity** Students spend the first half of term 5 looking at the genetic code, protein synthesis and mutations, as well as how populations change and evolve. The second half of the module involves statistical analysis of	1 x required practical 1 x mid-module mini assessment 1 x end of module assessment	Significant links to geography & ecology Careers skills – statistical analysis and when to use them, methods of investigating biodiversity in a

	biodiversity and correlations between variables involved in ecosystems, including Spearman's Rank and t-tests		population, ethics surrounding the study of animals
Year 12 Term 6	**Synoptic Links, Essay Skills & Revision** Students spend time looking at synoptic links between topics, bringing Biology to life in a broader context. They will also begin looking at the Paper 3 essay and applying their links. Revision is put in the context of exam questions and producing their own resources	1 x end of year assessment HOLIDAY HOMEWORK – Essay plans	Careers skills – linking knowledge, evaluation of research, application
Year 13 Term 1	**Energy Transfer Within and Between Organisms** Students start Year 13 building on the foundations from Year 12 and look at photosynthesis and respiration. This links into topic 1, 2 and 3. Students also study more ecological principles such as nutrient cycles	3 x required practical 1 x mid-module mini assessment 1 x end of module assessment	Links to geography, ecology and sport
Year 13 Term 2	**Organisms Respond to Environment** Plant and human responses to stimuli, including phototropism, skin and eyes, nerve transmission and homeostasis in health and disease	2 x required practical 1 x mid-module mini assessment 1 x end of module assessment	Lab skills for careers – Controlling variables, statistical data gathering and analysis, ethics for using animals in research, calibration curves and colorimetry

Year 13 Term 3	**Genetics, Populations & Ecosystems** Students will study populations genetics including dihybrid inheritance, sex-linked conditions, epistasis and the statistics to study them. Students also study population interactions including evolution, speciation, competition and succession	1 x required practical 1 x mid-module mini assessment 1 x end of module assessment	Links to geography and ecology Careers skills – Understanding and explaining genetics, statistical analysis
Year 13 Term 4	**Control of Gene Expression** Cutting edge gene technologies are the focus of this module, including the uses of stem cells, gene expression in cancer states and how genes can be cloned and used in forensics	1 x mid-module mini assessment 1 x end of module assessment	Careers skills – Gene technology processes, mutations and disease bases
Year 13 Term 5	**Revision and Essay Skills** Students to apply all learned knowledge to exam skills and preparation for their exams. Particular focus and attention will be drawn to essay skills and making key synoptic links, encouraging both breadth and depth across the syllabus	Terminal exams	N/A
Year 13 Term 6	**EXAM**		

For further information on this course please contact	Ms Lauren Cherry – Head of Science (CG) / Teacher of Biology laurencherry@universityofkentacademiestrust.org.uk