BIOLOGY
AS Level and A Level

The A level Biology course will follow the Edexcel Specification, Salters Nuffield Advanced Biology (SNAB) pathway. This pathway is a new innovative approach to Biology. It is taught in contemporary topics which are designed to motivate students. A dedicated website, multimedia resources and texts are designed to develop scientific understanding. Three units are assessed in Year 12 and three units are assessed in Year 13.

Entry requirements (Exam board: Edexcel)
Students will be expected to have 5 A*-B grades at GCSE or equivalent, including English and Maths and a minimum of Biology Grade B or an A in additional Science.

Course Outline (Exam Board: Edexcel - Context Based Approach)
This is a 6 module course, where 4 units are theory based/examination assessed and 2 are practical/coursework components. All assessments are in the summer.

What will I learn on this course? This course will enable you to:
1. use and analyse data;
2. understand how human/animal/plant systems work;
3. learn about factors in human health;
4. gain valuable practical skills (especially analytical techniques);
5. understand important environmental issues;
6. discuss current biological issues such as genetic engineering in an authoritative way.

Who would be a successful student of Biology? This course will appeal to students who:
1. enjoy scientific disciplines, practical and field work;
2. would like to know more about recent developments in genetics, health and the environment;
3. are studying related courses, such as chemistry, physics and sports studies;
4. would like to take a science subject to balance humanities or arts disciplines;
5. are interested in Biology.

Career Opportunities
You will find this course useful if you wish to follow a career in the following areas:
1. biological sciences;
2. research;
3. pharmacy;
4. medicine;
5. veterinary medicine;
6. health care professions
7. environmental sciences.
Course structure

AS Level
Unit 1 : Lifestyle, Transport, Genes and Health
Assessed Externally - 1 hour 15 minute examination  (40% of AS level / 20% of A2 level)
Topic 1 – Lifestyle, Health and Risk  This topic builds on the knowledge and understanding which students bring to the course on the functioning of the circulatory system and the importance of diet in maintaining the body. The role of diet and other lifestyle factors in maintaining good health is considered with particular reference to the heart and circulation and to cardiovascular disease. The structures and functions of some carbohydrates and lipids are also covered.

Topic 2 – Genes and Health  This topic looks at the properties and transport of materials across cell membranes and gas exchange surfaces. It looks at DNA structure, protein synthesis and inheritance through the context of the genetic disease, cystic fibrosis. The potential of gene therapy as a treatment for cystic fibrosis is considered. This topic allows the development of social and ethical issues surrounding the diagnosis and treatment of genetic conditions.

Unit 2 : Development, Plants and the Environment
Assessed Externally - 1 hour 15 minute examination  (40% of AS level / 20% of A2 level)
Topic 3 – Voice of the Genome  This topic follows the story of the development of multicellular organisms from single cells to complex individuals. The contribution of the Human Genome Project to our understanding of human genes and gene action is stressed. Cell structure and ultrastructure, cell differentiation, tissue organisation, cell division, the control of development, the roles of stem cells, gene expression and the importance of fertilisation are covered.

Topic 4 – Biodiversity and Natural Resources  This topic looks at how plants overcome problems associated with being rooted in one spot and investigates how we have exploited their solutions. It looks at the use of plant fibres, the use of plant extracts, genetic medication of plants and biodegradable starch packaging. General biological principles on anatomy and function, the role of starch and controversy surrounding genetically modified plants are covered, as is climate change.

Unit 3 - Practical Biology and Research Skills Assessed Internally (20% of AS level/10% of A2 level )
Research Skills (Coursework)  This is a written assessment based on a visit to a site of biological interest or a report of non-practical research on an area of Biological interest.
Practical Biology (Experiment Write ups)  This is an assessment based on a number of practicals that are undertaken during the course.
*Those students who wish to study only AS Biology will finish the course after these initial three units.

A2

Unit 4 –The Natural Environment and Species Survival
Assessed Externally - 1 hour 30 minute examination  (20% of A2 level)
Topic 5 – On the Wild Side. This topic looks at the role of classification in cataloguing the diversity of life. It looks at photosynthesis being the primary process which underpins ecosystems and leads on to how organisms are adapted to their environments. Natural selection and evolution are considered and the roles of zoos ad conservation areas are considered.
Topic 6 – Infection, Immunity and Forensics. This topic looks at how forensic pathologists use a wide variety of analytical techniques to determine the cause of death of organisms, including humans, to establish the time that has elapsed since death occurred. It looks at bacteria, viruses and the way that infectious diseases are spread by organisms.

Unit 5 – Energy, Exercise and Co-ordination Assessed Externally (1 hr 30 min examination (20% of A2 level)

Topic 7 – Run for your Life This topic looks at the adaptations that enable humans and other animals to undertake strenuous exercise. It looks at respiration and the links between homeostasis, muscle physiology and performance.

Topic 8 – Grey matter This topic is primarily concerned with the nervous system. It looks at how we respond to stimuli and the development of vision and learning. Ethics including the use of animals in medical research are considered.

Unit 6 – Practical Biology and Investigative - Internally Assessed (15% of A2)

This unit gives the students the opportunity to complete a written report of an experimental investigation, which they have devised and carried out.

For further information on this course, speak to Mr Shibli or Mr Jarvis, or Mrs Starkey.