

Biology A Level

Board: OCR, Specification Biology A

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Course Content and Assessment

Biology is the science of living organisms. It is a subject that encompasses a great diversity of topics ranging from the sub-cellular and molecular level to the interactions of populations, human and non-human. The specification is divided into topics, each covering different key concepts of biology but also encourages the understanding of how society makes decisions about scientific issues and how biological science contributes to the success of the economy and society.

Course content and assessment

The content is split into 6 teaching modules:

Module 1

Development of practical skills in biology

The development of practical skills is a fundamental and integral aspect of the study of any scientific subject. These skills not only enhance your understanding of the subject but also serve as a suitable preparation for the demands of studying biology at a higher level.

Module 2

Foundations in biology

All living organisms have similarities in cellular structure, biochemistry and function. An understanding of these similarities is fundamental to the study of the subject. This module gives you the opportunity to use microscopy to study the cell structure of a variety of organisms. Biologically important molecules such as carbohydrates, proteins, water and nucleic acids are studied with respect to their structure and function. The structure and mode of action of enzymes in catalysing biochemical reactions is studied. Membranes form barriers within, and at the surface of, cells. This module also considers the way in which the structure of membranes relates to the different methods by which molecules enter and leave cells and organelles. The division and subsequent specialisation of cells is studied, together with the potential for the therapeutic use of stem cells.

Module 3

Exchange and transport

In this module, you will study the structure and function of gas exchange and transport systems in a range of animals and in terrestrial plants. The significance of surface area to volume ratio in determining the need for ventilation, gas exchange and transport systems in multicellular organisms is emphasised. The examples of terrestrial green plants and a range of animal phyla are used to illustrate the principle.

Module 4

Biodiversity, evolution and disease

In this module you will study the biodiversity of organisms; how they are classified and the ways in which biodiversity can be measured. It serves as an introduction to ecology, emphasising practical techniques and an appreciation of the need to maintain biodiversity. You will also gain an understanding of the variety of organisms that are pathogenic and the way in which plants and animals have evolved defences to deal with disease. The impact of the evolution of pathogens on the treatment of disease is also considered. The relationships between organisms are studied, considering variation, evolution and phylogeny.

Module 5

Communication, homeostasis and energy

It is important that organisms, both plants and animals are able to respond to stimuli. This is achieved by communication within the body, which may be chemical and/or electrical. Both systems are covered in detail in this module. Communication is also fundamental to homeostasis with control of temperature, blood sugar and blood water potential being studied as examples. In this module, the biochemical pathways of photosynthesis and respiration are considered, with an emphasis on the formation and use of ATP as the source of energy for biochemical processes and synthesis of biological molecules.

Module 6

Genetics, evolution and ecosystems

This module covers the role of genes in regulating and controlling cell function and development. Heredity and the mechanisms of evolution and speciation are also covered. Some of the practical techniques used to manipulate DNA such as sequencing and amplification are considered and their therapeutic medical use. The use of microorganisms in biotechnology is also covered. Both of these have associated ethical considerations and it is important that

you develop a balanced understanding of such issues. You will gain an appreciation of the role of microorganisms in recycling materials within the environment and maintaining balance within ecosystems. The need to conserve environmental resources in a sustainable fashion is considered, whilst appreciating the potential conflict arising from the needs of an increasing human population. You will also consider the impacts of human activities on the natural environment and biodiversity.

Assessment

There are three written papers that assess content from ALL modules. Practical skills are assessed in the written papers.

Title	Duration (hrs/mins)	Modules assessed	% of total A Level grade
Biological processes	2.15	1, 2, 3 & 5	37%
Biological diversity	2.15	1, 2, 4 & 6	37%
Unifying concepts	1.30	All modules	26%

All papers are synoptic. In addition there is a practical endorsement in biology, which is a non-exam assessment. This will require you to complete and submit evidence of 12 practical tasks over the two years of study. It will result in either a pass or fail mark but does not contribute to the A Level mark. Universities offering science courses have said that they will require a pass in order to offer students a place.

Where next?

A biology qualification is suitable training for those wishing to continue their studies in the fields of psychology, behavioural science, biological sciences, biochemistry, dentistry, food sciences, agricultural sciences, environmental science, environmental health, medicine, genetics, veterinary science, nursing etc.

Courses listing

Robert Smyth Academy Prospectus

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