

FACULTY

SCIENCE

TITLE OF COURSE:

BIOLOGY

LEVEL:

ADVANCED HIGHER

RECOMMENDED ENTRY LEVELS:

A pass in Higher Biology or Human Biology preferably at A or B grade

Which topic areas are covered in Advanced Higher Biology?

UNIT 1 CELLS AND PROTEINS

1. Laboratory techniques for biologists

- (a) Health and safety
- (b) Liquids and solutions
- (c) Separation techniques
- (d) Antibody techniques
- (e) Microscopy
- (f) Cell culture and aseptic technique

2. Proteins

- (a) Proteomics
- (b) Protein structure, binding and conformational change
- (c) Membrane proteins
- (d) Detecting and amplifying an environmental stimulus
- (e) Communication within multicellular organisms
- (f) Protein control of cell division

UNIT 2 ORGANISMS AND EVOLUTION

1. Field techniques for biologists

- (a) Health and safety
- (b) Sampling of wild organisms
- (c) Identification and taxonomy
- (d) Monitoring populations
- (e) Measuring and recording animal behaviour

2. Organisms

- (a) Evolution
- (b) Variation and sexual reproduction
- (c) Sex and behaviour
- (d) Parasitism

UNIT 3 INVESTIGATIVE BIOLOGY

1. Scientific principles and process

- (a) Scientific method
- (b) Scientific literature and communication
- (c) Scientific ethics

2. Experimentation

- (a) Pilot study
- (b) Variables
- (c) Experimental design
- (d) Controls
- (e) Sampling
- (f) Ensuring reliability

3. Critical evaluation of biological research

- (a) Evaluating background information.
- (b) Evaluating experimental design
- (c) Evaluating data analysis
- (d) Evaluating conclusions

Which skills are taught?

- ◆ Extending and applying knowledge of biology to new situations, interpreting and analysing information to solve more complex problems
- ◆ planning and designing biological experiments/investigations, using reference materials and including risk assessments, to test a hypothesis or to illustrate particular effects
- ◆ carrying out complex experiments in biology safely, recording systematic detailed observations and collecting data
- ◆ selecting and presenting detailed information appropriately, in a variety of forms
- ◆ Processing and analysing biological information (using calculations, significant figures and units, where appropriate)
- ◆ Making reasoned predictions and generalisations from a range of evidence/information
- ◆ drawing valid conclusions and giving explanations supported by evidence/justification
- ◆ Critically evaluating experimental procedures by identifying sources of error, suggesting and implementing improvements
- ◆ drawing on knowledge and understanding of biology to make accurate statements, describe complex information, provide detailed explanations and integrate knowledge
- ◆ communicating biological findings/ information fully and effectively
- ◆ analysing and evaluating scientific publications and media reports

Assessment:

Progress of pupils is maintained throughout the course by unit assessments and an assessed practical investigation.

The external exam consists of one paper worth 75% and a biological investigation carried out at school, which is externally marked, worth 25%.

What careers would benefit from a knowledge of the subject?

A vast number of careers benefit from a knowledge of Biology. For example: Medicine, Bio-Engineering; Agriculture; Food Science; Forensics; Teaching; Dentistry; Nutrition; Journalism; Pharmacy; Archaeology; Immunology; Oceanography; Laboratory Technician; Physiotherapy; Nursing.

How can parents help?

Encourage students to take responsibility for their own learning and seek support where necessary.