



BIOLOGY – Years 3 & 4 Integrated Programme

INTRODUCTION

The use of molecular biology techniques has opened up great opportunities in improving the quality of human lives and the environment in which we live in. However, we also recognize that these techniques when misused will have equally large and undesirable consequences. A thorough understanding of the principles of biology is essential if we are to counter the threats and make the most of the opportunities available. It is therefore crucial that a biology programme promotes this understanding.

In this programme students are encouraged to develop their problem solving, critical thinking and communication skills. At the same time the curriculum also seeks to meet the affective needs of the students.

In ACS (Independent), there is another challenge to promote the concept of internationalism. Living organisms do not recognize national borders. At the same time we also recognize that living organisms within the biosphere are interdependent. The consequences of human activities will have impacts beyond national borders. Hence international co-operation is essential to protect the biosphere and its treasure trove of biodiversity. The biology curriculum takes into consideration such challenges and it provides students opportunities to examine such issues.



CURRICULUM GOALS

The curriculum goals of the ACS (Independent) Biology Year 3 & 4 IP Course are based on the four pillars of DISC (D-Diversity, I-Interactions, S-Systems and C-Communications). At the end of the course, students should be able to

- 1. demonstrate understanding and appreciation of natural phenomena (WON - Wonders of Nature);**
- 2. apply a body of knowledge within the biological systems and develop a concurrency of learning with other academic disciplines;**
- 3. demonstrate proficiency in the use of the scientific methodology as a way of generating knowledge;**
- 4. effectively use critical thinking skills to analyze, evaluate and synthesize information;**
- 5. appreciate the need for effective collaboration and communication during scientific activities;**
- 6. discuss the moral, ethical, social, economic and environmental implications of using science and technology;**
- 7. show an awareness of the possibilities and limitations associated with the use of science and technology;**



YEAR 3 IP BIOLOGY COURSE OUTLINE

- 1. Building Blocks of Life**
 - a) Cellular structures and organization
 - b) Biologically important macro-molecules
 - c) Movement of biological molecules
- 2. Energy Flow of Life**
 - a) Photosynthesis
 - b) Cellular Respiration
- 3. Organisation and Systems of Life**
 - a) Digestive System
 - b) Circulatory System
 - c) Respiratory System
 - d) Excretory System
 - e) Transport System in Flowering Plants
- 4. Making Sense of the Internal Environment**
 - a) Homeostasis
 - b) Endocrine System

YEAR 4 IP BIOLOGY COURSE OUTLINE

- 1. Making Sense of the External Environment**
 - a) Nervous System
 - b) The Eye
- 2. Continuity of Life**
 - a) Cell Division
 - b) Sexual Reproduction in Plants
 - c) Sexual Reproduction in Humans
- 3. Making Sense of the Blueprint of Life (Part I)**
 - a) DNA Structure
 - b) Central Dogma Theory
 - c) Mutations
 - d) Industrial Applications of Genetics
- 4. Making Sense of the Blueprint of Life (Part II)**
 - a) Mendelian Genetics – Monohybrid Inheritance
 - b) Mendelian Genetics – Sex-Linkage
 - c) Variations and Natural Selection
- 5. Biological Life and the Environment**
 - a) Ecology – Flow of Energy & Matter

ASSESSMENT MODES

Assessment for the Year 3 & 4 IP Biology Course will comprise coursework, assessment of practical skills and a final examination at the end of the year.

The table below summarises the student assessment modes for both years.

Assessment Modes	Weighting
Term 1 to 3 Coursework Assessment	30%
Term 4 Final Examination	70%