

## SCIENCE DEPARTMENT

IB science courses help students develop a knowledge of scientific facts, principles, and concepts; the ability to analyze scientific information critically and independently and to recognize the limitation of scientific knowledge; the ability to apply knowledge and skills to generate new knowledge; the awareness of the impact of science on ethical, philosophical, and political issues; and an understanding of the international dimensions of scientific thinking.

### **PRE-IB BIOLOGY (Grade 9)**

**3634/3635**

**Course Fee \$ 5.00**

**.5 credit/.5 credit**

Living organisms ranging from molecular levels to the biosphere are studied. Topics include scientific method, cytology, genetics, evolution, taxonomy, microbiology, botany, ecology, and anatomy and physiology, including the study of the human body and behavior.

### **IB BIOLOGY A/B (Grade 12)**

**3606/3607**

**Course Fee \$ 3.00**

**DOUBLE PERIOD**

**1 credit**

*Prerequisite: One year of honors, MYP or Pre-IB Biology and one year of honors, MYP, or Pre-IB Chemistry*

IB Biology is a double-period course that builds on the concepts and material covered in Pre-IB Biology and Pre-IB Chemistry. It offers extensive laboratory experiences and emphasizes critical analysis of scientific information, evaluation of biological knowledge with respect to those problems facing mankind at present, and synthesis of biological information from different areas of the field. Topics include biochemistry, cytology, molecular genetics, heredity and variation, reproduction, evolution, animal and plant physiology, ecology, and ethnology. Students complete the internal assessments and prepare for the higher-level IB Biology examination.

### **PRE-IB CHEMISTRY (Grade 10)**

**3744/3745**

**Course Fee \$ 5.00**

**.5 credit/.5 credit**

*Prerequisite: One year of biology*

The materials of our environment, their properties, and the way in which they react with each other are studied. Through a synthesis of laboratory work and descriptive and theoretical chemistry, the student gains factual knowledge drawn from the whole field of chemistry. Topics include properties of matter, atomic theory, chemical bonds and reaction kinetics, gases, periodicity and radioactivity, organic chemistry, solutions and solubility, thermodynamics, oxidation-reduction reactions, electrochemistry, and equilibrium systems. The course also focuses on developing the manipulative and experimental skills necessary to make the student competent in the processes of chemical investigation.

### **IB CHEMISTRY 1 (Grades 11-12)**

**3746/3747**

**Course Fee \$ 5.00**

**.5 credit/.5 credit**

*Prerequisite: Attainment of objectives of Pre-IB, MYP or Honors Chemistry*

IB Chemistry 1 is a study of the materials of our environment, their properties, and the way in which they react with each other. Topics of study include stoichiometry, atomic theory, periodicity, bonding, states of matter, energetics, kinetics, equilibrium, acids and bases, oxidation and reduction, organic chemistry and optional studies selected from a prescribed list. This course prepares students for the IB standard-level chemistry examination.

### **IB PHYSICS 1 A/B (Grade 11)**

**3844/3845**

**Course Fee \$ 5.00**

**.5 credit/.5 credit**

Students investigate physical laws and theories, relationships of physical phenomena and interrelationships of physics, and other fields of human endeavor. Topics include vector mathematics, kinematics, dynamics, energy, momentum, thermodynamics, waves, and optics. An additional focus is on the social and historical perspective in which physical ideas have developed throughout the world.

### **IB PHYSICS 2 A/B (Grade 12)**

**3846/3847**

**Course Fee \$ 5.00**

**.5 credit/.5 credit**

*Prerequisite: Attainment of the outcomes of Pre-Calculus and IB Physics 1*

IB Physics 2 is the second year of a two-year sequence designed to prepare students for the IB physics examination higher or standard level. It builds on the concepts and extends the laboratory work of IB Physics 1. Topics include relativity, electricity and magnetism, atomic and nuclear physics, quantum physics and astrophysics.

**IB/AP ENVIRONMENTAL SCIENCE (Grades 11-12)**

**3659/3660**

**.5 credit/.5 credit**

*Prerequisite: Attainment of the outcomes of Biology A and B*

*Co requisite: Chemistry A and B recommended*

Topics of this course combine those described by the IB and the Advanced Placement Program of the College Board. Students learn the scientific principles, concepts, and methodologies required to understand the environment, to evaluate the relative risks associated with environmental problems, and to examine alternative solutions for resolving and/or preventing them. Laboratory and field investigation provide opportunities to test concepts and principles that are introduced in the classroom. Extensive fieldwork allows students to explore specific problems in ways that are challenging, realistic, and relevant to their lives. The course prepares students to take the IB standard level environmental systems exams and/or the Advanced Placement Environmental Science exam.