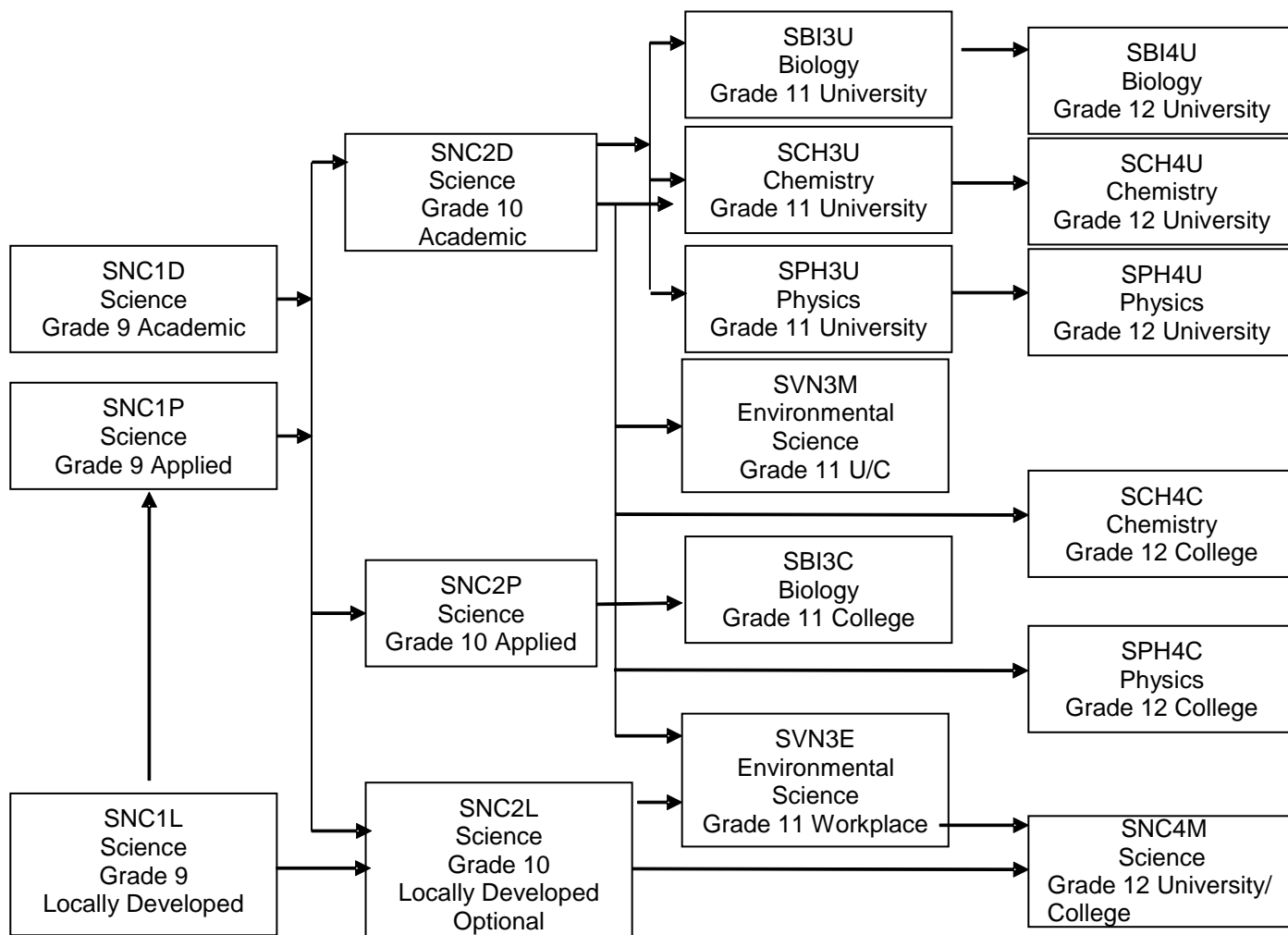


# SCIENCE



**STUDENTS MUST TAKE TWO CREDITS IN SCIENCE AND MAY CHOOSE TO TAKE AN ADDITIONAL CREDIT IN SCIENCE (GRADE 11 OR 12) TO SATISFY THE GROUP THREE REQUIREMENT**

## **SNC1D Science, Grade 9 (Academic)**

This course enables students to develop their understanding of basic concepts in biology, chemistry, earth and space science, and physics, and to relate science to technology, society, and the environment. Throughout the course, students will develop their skills in the **processes of scientific investigation**. Students will acquire an understanding of scientific theories and conduct investigations related to **sustainable ecosystems; atomic and molecular structures and the properties of elements and compounds; the study of the universe and its properties and components; and the principles of electricity**.

## **SNC1P Science, Grade 9 (Applied)**

This course enables students to develop their understanding of basic concepts in biology (Ecosystems), chemistry (Matter), earth and space science (Space Exploration), and physics (Electricity), and to apply their knowledge of science to everyday situations. They are also given opportunities to develop practical skills related to **scientific investigation**. Students will plan and conduct investigations into practical problems and issues related to the impact of human activity on **ecosystems; the structure and properties of elements and compounds; space exploration and the components of the universe; and static and current electricity**.

**SNC1L Science, Grade 9 (Locally Developed)**

This course develops science-related knowledge and skills to prepare students for success in everyday life, in the workplace, and in the science grade 11 workplace preparation course. Students explore scientific topics that connect with their lives by engaging in practical science activities. This course is designed to help students who had difficulty meeting the expectations of the mathematic and science programs in grade 7 and 8.

**SNC2D Science, Grade 10 (Academic)**

This course enables students to enhance their understanding of concepts in biology, chemistry, earth and space science, and physics, and of the interrelationships between science, technology, society, and the environment. Students are also given opportunities to further develop their scientific investigation skills. Students will plan and conduct investigations and develop their understanding of scientific theories related to the connections between cells and systems in animals and plants; chemical reactions, with a particular focus on acid–base reactions; forces that affect climate and climate change; and the interaction of light and matter.

**Prerequisite:** Science, grade 9, Academic or Applied

**SNC2P Science, Grade 10 (Applied)**

This course enables students to develop a deeper understanding of concepts in biology, chemistry, earth and space science, and physics, and to apply their knowledge of science in real-world situations. Students are given opportunities to develop further practical skills in scientific investigation. Students will plan and conduct investigations into everyday problems and issues related to human cells and body systems; chemical reactions; factors affecting climate change; and the interaction of light and matter.

**Prerequisite:** Science, grade 9, Academic or Applied

**SNC2L Science, Grade 10 (Locally Developed)**

This course strengthens science-related knowledge and skills to prepared students for success in everyday life, in the workplace, and in the Science grade 11 Workplace Preparation course. Students explore science in the media, interactions of common materials, organisms in communities and electrical energy through practical science activities.

**Prerequisite:** Science, grade 9, Locally Developed

## BIOLOGY

**SBI3UP Biology, Grade 11 (Advanced Placement University Preparation)**

This course furthers students' understanding of the processes that occur in biological systems. Students will study theory and conduct investigations in the areas of biodiversity; evolution; genetic processes; the structure and function of animals; and the anatomy, growth, and function of plants. The course focuses on the theoretical aspects of the topics under study, and helps students refine skills related to scientific investigation.

The Advanced Placement (AP) Biology (SBI3UP) course is an accelerated and advanced level program designed to help prepare students for the AP grade 12 course, SBI4UP.

**Prerequisite:** Science, grade 10, Academic

**SBI3U Biology, Grade 11 (University Preparation)**

This course furthers students' understanding of the processes that occur in biological systems. Students will study theory and conduct investigations in the areas of biodiversity; evolution; genetic processes; the structure and function of animals; and the anatomy, growth, and function of plants. The course focuses on the theoretical aspects of the topics under study, and helps students refine skills related to scientific investigation.

**Prerequisite:** Science, grade 10, Academic

**SBI3C Biology, Grade 11 (College Preparation)**

This course focuses on the processes that occur in biological systems. Students will learn concepts and theories as they conduct investigations in the areas of cellular biology, microbiology, genetics, the anatomy of mammals, and the structure of plants and their role in the natural environment. Emphasis will be placed on the practical application of concepts, and on the skills needed for further study in various branches of the life sciences and related fields.

**Prerequisite:** Science, grade 10, Academic or Applied

### **SBI4UP Biology, Grade 12 (Advanced Placement University Preparation)**

This course provides students with the opportunity for in-depth study of the concepts and processes that occur in biological systems. Students will study theory and conduct investigations in the areas of **biochemistry, metabolic processes, molecular genetics, homeostasis, and population dynamics**. Emphasis will be placed on the achievement of detailed knowledge and the refinement of skills needed for further study in various branches of the life sciences and related fields.

The Advanced Placement (AP) Biology (SBI4U) course is an accelerated and advanced level program designed to meet the rigorous requirements of the American College Board examination in May, allowing students to experience university level programming while still in high school.

**Prerequisite: Biology, grade 11, University Preparation**

### **SBI4U Biology, Grade 12 (University Preparation)**

This course provides students with the opportunity for in-depth study of the concepts and processes that occur in biological systems. Students will study theory and conduct investigations in the areas of **biochemistry, metabolic processes, molecular genetics, homeostasis, and population dynamics**. Emphasis will be placed on the achievement of detailed knowledge and the refinement of skills needed for further study in various branches of the life sciences and related fields.

**Prerequisite: Biology, grade 11, University Preparation**

## **CHEMISTRY**

### **SCH3U Chemistry, Grade 11 (University Preparation)**

This course enables students to deepen their understanding of chemistry through the study of the properties of chemicals and chemical bonds; chemical reactions and quantitative relationships in those reactions; solutions and solubility; and atmospheric chemistry and the behaviour of gases. Students will further develop their analytical skills and investigate the qualitative and quantitative properties of matter, as well as the impact of some common chemical reactions on society and the environment.

**Prerequisite: Science, grade 10, Academic**

### **SCH4U Chemistry, Grade 12 (University Preparation)**

This course enables students to deepen their understanding of chemistry through the study of **organic chemistry, the structure and properties of matter, energy changes and rates of reaction, equilibrium in chemical systems, and electrochemistry**. Students will further develop their problem-solving and investigation skills as they investigate chemical processes, and will refine their ability to communicate scientific information. Emphasis will be placed on the importance of chemistry in everyday life and on evaluating the impact of chemical technology on the environment.

**Prerequisite: Chemistry, Grade 11, University Preparation**

### **SCH4C Chemistry, Grade 12 (College Preparation)**

This course enables students to develop an understanding of chemistry through the study of **matter and qualitative analysis, organic chemistry, electrochemistry, chemical calculations, and chemistry as it relates to the quality of the environment**. Students will use a variety of laboratory techniques, develop skills in data collection and scientific analysis, and communicate scientific information using appropriate terminology. Emphasis will be placed on the role of chemistry in daily life and the effects of technological applications and processes on society and the environment.

**Prerequisite: Science, grade 10, Academic or Applied**

# PHYSICS

## **SPH3U Physics, Grade 11 (University Preparation)**

This course develops students' understanding of the basic concepts of physics. Students will explore **kinematics, with an emphasis on linear motion; different kinds of forces; energy transformations; the properties of mechanical waves and sound; and electricity and magnetism**. They will enhance their scientific investigation skills as they test laws of physics. In addition, they will analyse the interrelationships between physics and technology, and consider the impact of technological applications of physics on society and the environment.

**Prerequisite: Science, grade 10, Academic**

## **SPH4U Physics, Grade 12 (University Preparation)**

This course enables students to deepen their understanding of physics concepts and theories. Students will continue their exploration of **energy transformations and the forces that affect motion, and will investigate electrical, gravitational, and magnetic fields and electromagnetic radiation**. Students will also explore **the wave nature of light, quantum mechanics, and special relativity**. They will further develop their scientific investigation skills, learning, for example, how to analyse, qualitatively and quantitatively, data relating to a variety of physics concepts and principles. Students will also consider the impact of technological applications of physics on society and the environment.

**Prerequisite: Physics, grade 11, University Preparation**

## **SPH4UP Physics, Grade 12 (Advanced Placement University Preparation)**

This course enables students to deepen their understanding of physics concepts and theories. Students will continue their exploration of **energy transformations and the forces that affect motion, and will investigate electrical, gravitational, and magnetic fields and electromagnetic radiation**. Students will also explore **the wave nature of light, quantum mechanics, and special relativity**. They will further develop their scientific investigation skills, learning, for example, how to analyse, qualitatively and quantitatively, data relating to a variety of physics concepts and principles. Students will also consider the impact of technological applications of physics on society and the environment.

The Advanced Placement (AP) Biology (SBI4U) course is an accelerated and advanced level program designed to meet the rigorous requirements of the American College Board examination in May, allowing students to experience university level programming while still in high school.

**Prerequisite: Physics, grade 11, University Preparation**

## **SPH4C Physics, Grade 12 (College Preparation)**

This course develops students' understanding of the basic concepts of physics. Students will explore these concepts with respect to **motion; mechanical, electrical, electromagnetic, energy transformation, hydraulic, and pneumatic systems; and the operation of commonly used tools and machines**. They will develop their scientific investigation skills as they test laws of physics and solve both assigned problems and those emerging from their investigations. Students will also consider the impact of technological applications of physics on society and the environment.

**Prerequisite: Science, grade 10, Academic or Applied**

## OPTIONAL SCIENCE COURSES

### **SVN3M Environmental Science, Grade 11 (University/College Preparation)**

This course provides students with the fundamental knowledge of and skills relating to environmental science that will help them succeed in life after secondary school. Students will explore a range of topics, including the role of science in addressing contemporary environmental challenges; the impact of the environment on human health; sustainable agriculture and forestry; the reduction and management of waste; and the conservation of energy. Students will increase their scientific and environmental literacy and examine the interrelationships between science, the environment, and society in a variety of areas.

**Prerequisite: Science, grade 10, Applied or Academic**

### **SVN3E Environmental Science, Grade 11 (Workplace Preparation)**

This course provides students with the fundamental knowledge of and skills relating to environmental science that will help them succeed in work and life after secondary school. Students will explore a range of topics, including the impact of human activities on the environment; human health and the environment; energy conservation; resource science and management; and safety and environmental responsibility in the workplace. Emphasis is placed on relevant, practical applications and current topics in environmental science, with attention to the refinement of students' literacy and mathematical literacy skills as well as the development of their scientific and environmental literacy.

**Prerequisite: Science, grade 9, Academic or Applied, or a grade 9 or 10 locally developed compulsory credit (LDCC) course in science**

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### **SNC4E Science, Grade 12 (Workplace Preparation)**

This course provides students with fundamental science knowledge and workplace skills needed to prepare them for success beyond secondary school. Students will explore hazards in the workplace, chemicals in consumer products, disease and its prevention, electricity at home and at work, and nutritional science. Emphasis is placed on current topics in science and relevant, practical activities that develop students' literacy and mathematical literacy skills and enhance their scientific literacy.

**Prerequisite: Science, grade 10, Applied, or a grade 10 locally developed compulsory credit (LDCC) course in science**

### **SNC4M Science, Grade 12 (University/College Preparation)**

This course enables students, including those pursuing postsecondary programs outside the sciences, to increase their understanding of science and contemporary social and environmental issues in health-related fields. Students will explore a variety of medical technologies, pathogens and disease, nutritional science, public health issues, and biotechnology. The course focuses on the theoretical aspects of the topics under study and helps refine students' scientific investigation skills.

**Prerequisite: Science, Grade 10, Academic, or any Grade 11 university, university/college, or college preparation course in science.**