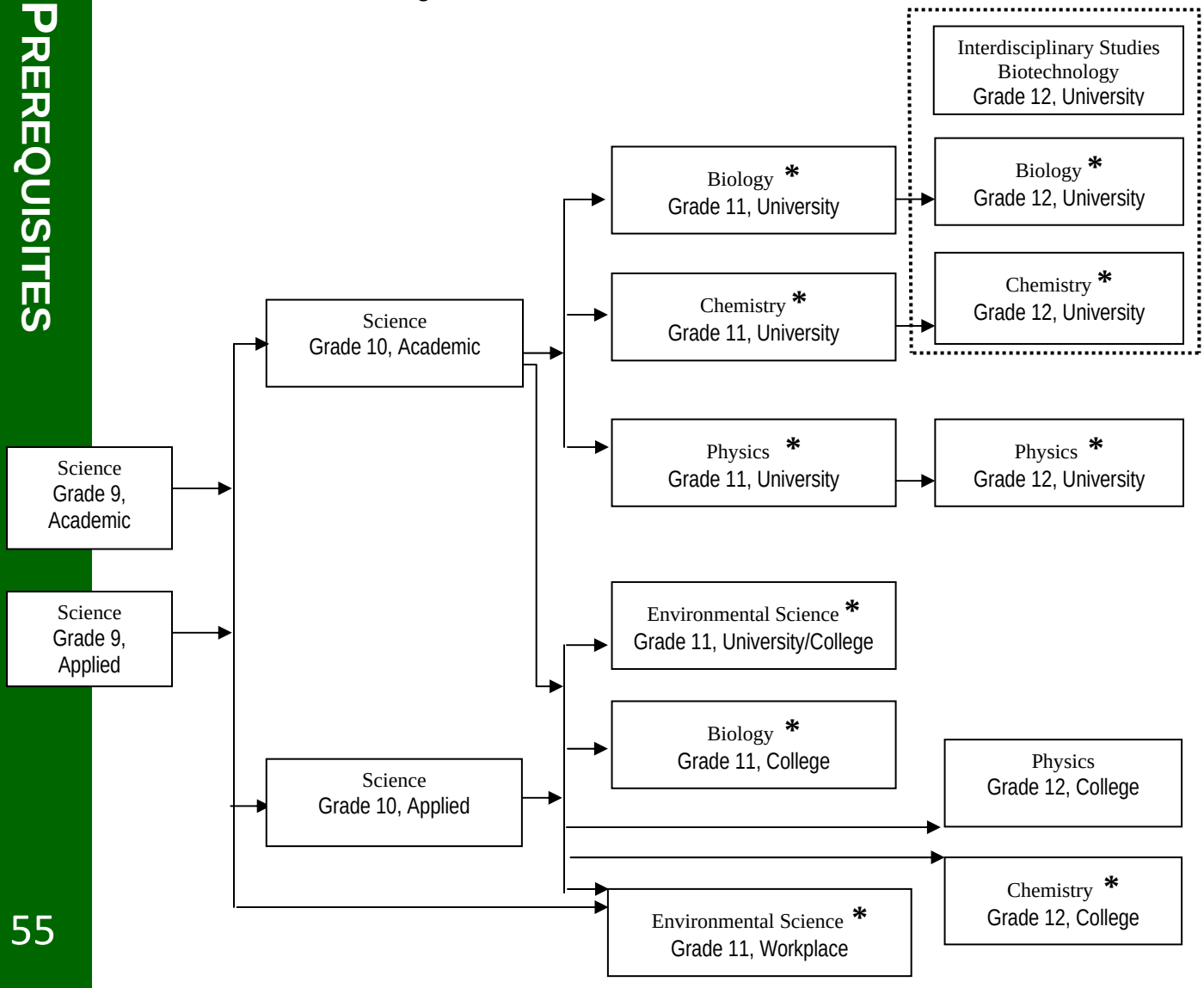
SCIENCE DEPARTMENT

PREREQUISITE CHART FOR SCIENCE, GRADE 9-12

This chart maps out all the courses in the discipline and shows the links between courses and the possible prerequisites for them. It does not attempt to depict all possible movements from course to course.

***Can contribute towards SHSM-The Environment Program (See page 67)**

www.ugdsb.on.ca/shsm/shsm-environmental.html



SCIENCE COURSES

Courses coded 3 or 4 may be taken in either years 3 or 4, but not before.

Students taking any of the Science Coop Education programs will be in one class during the second semester. The Science Coop component should be taken after the in-school course or as a co-requisite.

Students considering a university science or engineering program should check the university requirements to ensure they take the proper courses.

Students should take the mathematics courses for the appropriate years.

Grade 9
- Science, Academic
- Science, Applied

Grade 10
- Science, Academic
- Science, Applied

Grade 11
- Biology, College
- Biology, University
- Environmental Science, Workplace
- Environmental Science, University /College
- Chemistry, University
- Physics, University

Grade12
- Biology, University
- Physics, College **NEW*
- Physics, University
- Chemistry, College
- Chemistry, University
- Interdisciplinary Studies: Biotechnology

Science Cooperative Education

SHSM-The Environment

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, chemistry, earth and space science, and physics, 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.

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 connections between cells and systems and 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 (A mark of 70% is recommended.)

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 human cells and body systems; chemical reactions; factors affecting climate change; and the interaction of light and matter.
Prerequisite: Science, Gr. 9, Academic or Applied

SBI3C

Biology, Grade 11, College Preparation

This course focuses on the processes involved in biological systems. Students will learn concepts and theories as they conduct investigations in the areas of cellular biology, microbiology, animal anatomy and physiology, plant structure and physiology, and environmental science. 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 (A mark of 65% is recommended.)

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. The course is a prerequisite for SBI4U.

Prerequisite: Science, Grade 10, Academic (A mark of 70% is recommended.)

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 (A mark of 70% is recommended.)

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

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. This course is a prerequisite for SCH4U.

Prerequisite: Science, Grade 10, Academic (A mark of 70% is recommended)

Recommended Preparation: MPM 2D

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 (A mark of 70% is recommended)

Recommended Preparation: MPM2D

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 (A mark of 70% is recommended)

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 analyze, 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 (A mark of 70% is recommended)

SPH4C

Physics, Grade 12, College Preparation 

This course develops students' understandings 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.

This course runs every other year and will be offered in during the 2012 - 2013 school year.

Prerequisite: Science Grade 10, Applied or Academic (a mark of 65% is recommended)

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 (A mark of 70% is recommended)

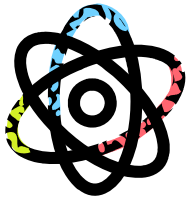
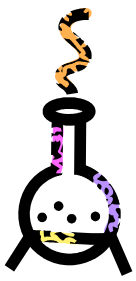
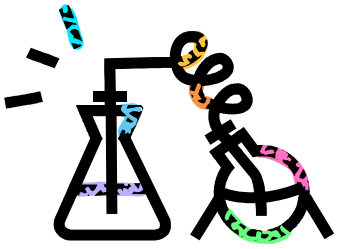
SCH4C

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.

This course runs every other year and will be offered during the 2013 -2014 school year.

Prerequisite: Science Grade 10, Applied or Academic (A mark of 65% is recommended)

- SCIENCE COOPERATIVE EDUCATION
- SPECIALIST HIGH SKILLS MAJOR
- INTERDISCIPLINARY STUDIES

SCIENCE COOPERATIVE EDUCATION

Refer to the Coop section on page 70 for information about Cooperative Education and to access the correct course codes for applying.

Students taking any of the Science Cooperative Education programs will be in one class during the second semester. The Science Coop component should be taken after the in-school course or co-requisite.

BIOLOGY
Prerequisite or Co-requisite:
SBI3C or SBI3U

CHEMISTRY
Prerequisite or Co-requisite:
SCH3U, SCH4C

PHYSICS
Prerequisite or Co-requisite:
SPH3U

SCIENCE
Prerequisite or Co-requisite:
SVN3M, SVN3E/3M

SPECIALIST HIGH SKILLS MAJOR – THE ENVIRONMENT

Refer to the SHSM section on page 67 for more information about this program and how to apply.

A SHSM allows students to focus on knowledge and skills that are of particular importance in the environmental science sector, as they work towards meeting the requirements for an Ontario Secondary School Diploma (OSSD).

Students who graduate with a SHSM designation on their diploma are better prepared for success in the post secondary destination of their choice, whether it is apprenticeship training, a college or university program, or the workplace.

IDP4U GRADE 12, UNIVERSITY PREPARATION
INTERDISCIPLINARY STUDIES : BIOTECHNOLOGY PACKAGE

***If you select* IDP4U *Biotechnology, you must also select* SBI4UI *and* SCH4U.**

Students may not receive a credit in both* IDC4U *(The Business of Sport) and* IDP4U *(Biotechnology)

Application forms are in the Guidance Office.

Prerequisites
Biology, Grade 11, University Preparation-SBI3U and
Chemistry, Grade 11, University Preparation-SCH3U
A minimum mark of 70% is recommended.

Co-requisites
Biology, Grade 12, University Preparation-SBI4U and
Chemistry, Grade 12, University Preparation-SCH4U

Credit Value: three (3) in total
1 credit-Grade 12 Interdisciplinary Studies, University
1 credit-Grade 12 Biology, University
1 credit-Grade 12 Chemistry, University

Students who opt for IDP4U:Biotechnology will cover all of the expectations of the co-requisites SBI4U and SCH4U: for further information on these credits please see the relevant course description listed in this section. The Interdisciplinary Studies component of this package applies the knowledge presented in the chemistry and biology disciplines to the emerging discipline of Biotechnology. The IDP4U credit will help students develop and consolidate the skills required for problem solving, decision making, effective communication of ideas, and communication of findings. Students will apply the principles and processes of inquiry and research: to effectively use a range of print, electronic, and mass media resources; to analyze historical innovations and exemplary research; and to investigate real-life issues, career opportunities, and possible career paths in Biotechnology.