

# CHEMISTRY (CHEM)

## CHEM 040 Chemistry 040 Advanced Chemistry

4 Credits

This is an introductory chemistry course. This course is designed to be delivered in an instructor led manner in one semester. Major topics include lab safety, measurement and matter, properties of substances, periodic trends, atomic structure, mole concept, bonding, nomenclature, chemical reactions and calculations, solutions and organic chemistry.

### Prerequisites

Foundations of Mathematics & Pre-Calculus 10 or Math 0301/0302 or equivalent or placement at the Math 0401 level and English Language Arts 10 or English 030 or placement at the English 040 level.

### Transfer Credits

Explore transfer credit opportunities by visiting the BC Transfer Guide (<http://www.bctransferguide.ca>)

## CHEM 101 Introductory Chemistry I

3 Credits

Three topics will be covered. The first is a review of general chemical principles, including stoichiometric descriptions of chemical reactions together with a brief history of chemistry as a science. Next, the microscopic description of the natural world as it relates to chemistry, will be discussed with particular consideration to atomic structure and chemical bonding. Finally, macroscopic chemistry will be investigated and will include conservation of energy as it applies to macroscopic chemistry, that is, in terms of thermodynamics. It will also include a description of the various states of matter, namely, gases, liquids and solids. (3,3,0)

### Prerequisites

Chemistry 11 and Principles of Math 11; or Pre-Calculus 11

### Transfer Credits

Explore transfer credit opportunities by visiting the BC Transfer Guide (<http://www.bctransferguide.ca>)

## CHEM 102 Introductory Chemistry II

3 Credits

Continuation of the study of chemical principles initiated in CHEM 101, this course also consists of three topics. In the first, a quantitative description of chemical reactions with a look at both the short term rates of reactions and their long time, or equilibrium, behaviour will be carried out. In the second, an introduction to electrochemical and a study of oxidation/reduction reactions and electrochemical cells (batteries) and their applications will be conducted. The final topic will include a survey of organic chemistry covering organic nomenclature and a description of simple reactions associated with various organic functional groups. (3,3,0)

### Prerequisites

CHEM 101 or CHEM 121

### Transfer Credits

Explore transfer credit opportunities by visiting the BC Transfer Guide (<http://www.bctransferguide.ca>)

## CHEM 111 Fundamentals of Chemistry I

3 Credits

This course introduces students to fundamental principles of chemistry including the concepts of nomenclature, stoichiometry, states of matter, atoms and subatomic particles, quantum chemistry, bonding, intermolecular forces and their influence on states of matter. Microscopic description of the natural world will be used to explain macroscopic effects, and to observe the connections to other disciplines. A tutorial will support students with either Chem 11 or Chem 12 background. This course will be followed by Chem 122 - Principles of Chemistry II. (3,3,1)

### Prerequisites

Chemistry 11 or Chemistry 12 and Math 11 or Pre-Calculus 11

### Transfer Credits

Explore transfer credit opportunities by visiting the BC Transfer Guide (<http://www.bctransferguide.ca>)

## CHEM 121 Principles of Chemistry I

3 Credits

Designed for students with grade 12 chemistry and mathematics. A working knowledge of stoichiometry and other basic algebraic and chemistry skills is assumed. In CHEM 121, four topics will be covered in depth. The first two topics deal with the microscopic description of the natural world as it relates to chemistry. In particular, in the first topic, atomic structure, relations between the electronic structure of atoms and the periodic table are discussed while in the second topic, this electronic structure is applied to structure and chemical bonding in molecules. The last two topics deal with some aspects of macroscopic chemistry. In the third topic is a discussion of the phases or states of matter, namely, gases, liquids and solids, while the fourth topic, inorganic chemistry, is a description of the properties and reactions of metals and non-metals. (3,3,0)

### Prerequisites

Chemistry 12 and Principles of Math 12; or Pre-Calculus 12; Co-requisite: MATH 101

### Transfer Credits

Explore transfer credit opportunities by visiting the BC Transfer Guide (<http://www.bctransferguide.ca>)

## CHEM 122 Principles of Chemistry II

3 Credits

Continuation of the study of chemical principles initiated in CHEM 121, this course consists of three topics, namely, thermodynamics, a quantitative description of chemical reactions and a survey of organic chemistry. In the first topic, the four laws of thermodynamics will be discussed with particular emphasis on their application to chemical reactions. The second topic deals with the time dependence of chemical reactions, both short times, chemical kinetics, and long times, chemical equilibrium. The final topic includes nomenclature, structure and properties of simple organic compounds as well as a description of some reactions associated with various organic functional groups. (3,3,0)

### Prerequisites

CHEM 121 or CHEM 111 and MATH 101; Co-requisite: MATH 102

### Transfer Credits

Explore transfer credit opportunities by visiting the BC Transfer Guide (<http://www.bctransferguide.ca>)



**CHEM 190 Chemistry of Brewing**

3 Credits

This course is an overview of the chemistry involved in the brewing, packaging, and taste of beer. An introduction to the history of beer making around the world will be reviewed. Beer's role in different cultures as well as its effects on human health will be covered. Next, the ingredients that make up beer will be discussed with a focus on when they are added and what effect they play in the final product. General principles of the chemistry of beer-making will be discussed for all steps of the brewing process. The chemical changes that occur during milling, mashing, wort separation, boiling, hopping, and chilling will be explained using principles that are presented in class. The process of fermentation will be reviewed in detail. Additional topics include the chemistry of flavour, beer styles, foam, haze, and stability. The importance of packaging and presentation of beer will be included. (3,0,0)

**Prerequisites**

English 12 or equivalent

**Transfer Credits**Explore transfer credit opportunities by visiting the BC Transfer Guide (<http://www.bctransferguide.ca>)**CHEM 230 Organic Chemistry I**

3 Credits

This course provides students who have taken first year chemistry with an in depth introduction to organic chemistry. Topics included in this course are a detailed study of the properties and reactions of alkanes, alkenes, alkynes, aromatics, arenes and alkyl halides. (3,3,0)

**Prerequisites**

CHEM 101 and CHEM 102 or CHEM 121 and CHEM 122

**Transfer Credits**Explore transfer credit opportunities by visiting the BC Transfer Guide (<http://www.bctransferguide.ca>)**CHEM 231 Organic Chemistry II**

3 Credits

This course is a continuation of the in depth introduction to organic chemistry begun in CHEM 230. Topics included in this course are a detailed study of the properties and reactions of alcohols, ethers, carboxylic acids, aldehydes, ketones, amines, phenols and carbohydrates. (3,3,0)

**Prerequisites**

CHEM 230

**Transfer Credits**Explore transfer credit opportunities by visiting the BC Transfer Guide (<http://www.bctransferguide.ca>)**CHEM 0401 Advanced Chemistry 0401**

2 Credits

This is the first half of an introductory chemistry course. This course in combination with the follow up course, Chemistry 0402 is equivalent to Chemistry 040. The modular courses are intended for self paced delivery or delivery of Advanced Chemistry over two semesters. Major topics include lab safety, measurement and matter, properties of substances, periodic trends atomic structure, nomenclature, chemical reactions and calculations.

**Prerequisites**

Foundations of Mathematics &amp; Pre-Calculus 10 or Math 0301/0302 or equivalent or placement at the Math 0401 level and English Language Arts 10 or English 030 or placement at the English 040 level.

**Transfer Credits**Explore transfer credit opportunities by visiting the BC Transfer Guide (<http://www.bctransferguide.ca>)**CHEM 0402 Advanced Chemistry 0402**

2 Credits

This is the second half of an introductory chemistry course. This course in combination with the prior course, Chemistry 0401 is equivalent to Chemistry 040. The modular courses are intended for self paced delivery or delivery of Advanced Chemistry over two semesters. Major topics include lab safety, atomic structure, mole concept, bonding, chemical reactions, solutions and organic chemistry.

**Prerequisites**

Completion of Advanced Chemistry 0401.

**Transfer Credits**Explore transfer credit opportunities by visiting the BC Transfer Guide (<http://www.bctransferguide.ca>)