City University of Hong Kong

Information on a Course
offered by Department of Biology and Chemistry
with effect from 2013/2014

Part I

Course Title: Chemistry
Course Code: BCH1100
Course Duration: ONE Semester
No. of Credit Units: 3
Level: B1
Prerequisites: (Course Code and Title) N/A
Precursors: (Course Code and Title) N/A
Equivalent Courses: (Course Code and Title) NIL
Exclusive Courses: (Course Code and Title) NIL

Part II

1. Course Aims:

This course aims to provide an introduction to the fundamental concepts in Chemistry and its importance to the society through discussions on current issues with significant chemical context.

Upon completion of this course, students should be able to:

a. demonstrate an understanding of the basic concepts and principles of Chemistry,
b. observe simple chemical reactions and solve calculations on chemical reactions,
c. appreciate Chemistry and its application in daily life.
2. Course Intended Learning Outcomes (CILOs)

Upon successful completion of this course, students should be able to:

<table>
<thead>
<tr>
<th>No.</th>
<th>CILOs</th>
<th>Weighting (if applicable)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Describe the concept of atoms, molecules, and ions, neutrons, protons and electrons, the periodic table, chemical formula and naming, acids and bases, states of matter, chemical reactions.</td>
<td>20 %</td>
</tr>
<tr>
<td>2.</td>
<td>Rationalize the electronic structures of atoms, ions, and molecules and chemical compounds through the formation of ionic and covalent bonds, and explain their physical and chemical properties.</td>
<td>20 %</td>
</tr>
<tr>
<td>3.</td>
<td>Apply the principles of stoichiometry and moles and relate these to mass balance, empirical and molecular formula, and chemical equation.</td>
<td>20 %</td>
</tr>
<tr>
<td>4.</td>
<td>Discuss the basic principles of chemistry embedded within current real-world issues, such as quality of air and water, global warming, acid rain, energy resources, plastics, foods and drugs.</td>
<td>20 %</td>
</tr>
<tr>
<td>5.</td>
<td>Discover real-life examples and applications related to the basic principles of chemistry.</td>
<td>20 %</td>
</tr>
</tbody>
</table>

3. Teaching and learning Activities (TLAs)
(designed to facilitate students’ achievement of the CILOs)

<table>
<thead>
<tr>
<th>ILO No</th>
<th>TLAs</th>
<th>Hours/week (if applicable)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CILO 1</td>
<td>Lectures, interactive questioning and tutorials, and videos will enable students to recognize the basic knowledge and concepts and the relationship between them, and give them practice in explaining these to peers.</td>
<td>See Teaching Pattern on p.5</td>
</tr>
<tr>
<td>CILO 2</td>
<td>Lectures, interactive questioning and tutorials, and videos will enable students to acquire the basic knowledge and concepts in inorganic and organic chemistry and give them practice in explaining these to peers.</td>
<td>See Teaching Pattern on p.5</td>
</tr>
<tr>
<td>CILO 3</td>
<td>Lectures, interactive questioning and tutorials, laboratory demonstrations, and videos will enable students to recognize the basic knowledge and concepts and the relationship between them, and give them practice in explaining these to peers.</td>
<td>See Teaching Pattern on p.5</td>
</tr>
<tr>
<td>CILO 4</td>
<td>Lectures, interactive questioning and tutorials, and laboratory demonstrations will enable students to appreciate the basic knowledge and concepts embedded in real-world issues with significant chemical context, and give them practice in explaining these to peers.</td>
<td>See Teaching Pattern on p.5</td>
</tr>
</tbody>
</table>
CILO 5  Students are divided into groups in laboratory sessions to discover real-life examples and applications in different activities which are related to basic concepts of chemistry. Lectures, group discussions and literature surveys will provide support to enable students to appreciate the basic knowledge and concepts embedded in real-world issues with significant chemical context, and give them practice in explaining these to peers.

4. Assessment Tasks/Activities
(designed to assess how well the students achieve the CILOs)

<table>
<thead>
<tr>
<th>ILO No</th>
<th>Type of assessment tasks/activities</th>
<th>Weighting (if applicable)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>CILO 1</td>
<td>Examination, and tutorials and assignments (including through online learning), with timely feedback, will be used to assess how well the students can describe and apply important concepts in chemistry.</td>
<td>Refer to the following table in Section 5</td>
<td></td>
</tr>
<tr>
<td>CILO 2</td>
<td>Examination, and tutorials and assignments (including through online learning), with timely feedback, will be used to assess how well the students can describe and apply important concepts in chemistry.</td>
<td>Refer to the following table in Section 5</td>
<td></td>
</tr>
<tr>
<td>CILO 3</td>
<td>Examination, tutorials and assignments (including through online learning), and laboratory demonstrations and reports with timely feedback, will be used to assess how well the students can describe and apply important concepts in chemistry.</td>
<td>Refer to the following table in Section 5</td>
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<tr>
<td>CILO 4</td>
<td>Examination, tutorials and assignments (including through online learning), and laboratory demonstrations and reports with timely feedback, will be used to assess how well the students can describe and apply important concepts in chemistry.</td>
<td>Refer to the following table in Section 5</td>
<td></td>
</tr>
<tr>
<td>CILO 5</td>
<td>Examination, group discussions in tutorials and laboratory sessions, and assignments with timely feedback, will be used to assess how well the students can describe and apply important concepts in chemistry and connect chemistry with daily life.</td>
<td>Refer to the following table in Section 5</td>
<td></td>
</tr>
</tbody>
</table>

Starting from Semester B, 2002-03, undergraduate students must satisfy the following minimum passing requirements for BCH courses:
"A minimum of 30% in coursework as well as examination, in addition to a minimum of 40% in coursework and examination taken together".
5. **Grading of Student Achievement:** Refer to Grading of Courses in the Academic Regulations

Grading will be based on students’ performance in assessment tasks and activities. Allocation of marks will be as follows: Coursework 50% (including tutorials and assignments, online learning, laboratory reports, peer reviewed quizzes, discussion); examination (2 hrs) 50%.

The table below is indicative of the assessment weighting for each CILO.

<table>
<thead>
<tr>
<th>CILO</th>
<th>Tutorials &amp; Assignments</th>
<th>Laboratory</th>
<th>Examination</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>CILO 1</td>
<td>7 %</td>
<td>3 %</td>
<td>10 %</td>
<td>20 %</td>
</tr>
<tr>
<td>CILO 2</td>
<td>7 %</td>
<td>3 %</td>
<td>10 %</td>
<td>20 %</td>
</tr>
<tr>
<td>CILO 3</td>
<td>7 %</td>
<td>3 %</td>
<td>10 %</td>
<td>20 %</td>
</tr>
<tr>
<td>CILO 4</td>
<td>7 %</td>
<td>3 %</td>
<td>10 %</td>
<td>20 %</td>
</tr>
<tr>
<td>CILO 5</td>
<td>7 %</td>
<td>3 %</td>
<td>10 %</td>
<td>20 %</td>
</tr>
<tr>
<td><strong>Grand Total</strong></td>
<td>35 %</td>
<td>15 %</td>
<td>50 %</td>
<td>100 %</td>
</tr>
</tbody>
</table>

**Grade Descriptions**

The following description is indicative of the grading criteria adopted for assessment purposes:

A. Student completes all assessment tasks/activities and demonstrates excellent grasp of the basic knowledge and important concepts of chemistry, and can apply these concepts to solve problems with clear and logical explanations. Shows evidence of demonstrated use of concepts for rationalization, with some originality in thought and argument. Displays superior writing and presentation skills.

B. Student completes all assessment tasks/activities and can describe and explain the basic knowledge and important concepts of chemistry. Shows, to some extent, the ability to use concepts for rationalization and to solve problems. Displays effective writing and presentation skills.

C. Student completes all assessment tasks/activities and can describe and explain some key elements of the knowledge and concepts of chemistry. Shows limited ability to apply concepts, and competent writing and presentation skills.

D. Student completes all assessment tasks/activities but only can briefly describe isolated elements of the knowledge and concepts of chemistry. Demonstrates limited ability in analysis, with a lack of ability in using and applying concepts. Can communicate simple knowledge in writing.

F. Student fails to complete all assessment tasks/activities and/or cannot accurately describe the knowledge and concepts of some aspects of chemistry. Cannot perform appropriate analysis, with no ability to apply concepts. May show inability to communicate knowledge.
Part III
Keyword Syllabus:

**Fundamental Concepts:**
Atoms, Ions, and Molecules
Periodic Table
Electronic Structure of Atoms
Chemical Bonding: ionic and covalent
Stoichiometry: Calculations with Chemical Formulas and Equations
States of Matters: Gases, Liquids, and Solids
Chemical Kinetics and Equilibrium
Thermochemistry
Acids and Bases
Oxidation and Reduction
Nuclear Chemistry
Inorganic and Organic Chemistry
Biological Chemistry

**Examples of Daily-Life Chemistry**
Global Warming, Ozone Layer, Acid Rain, Energy, Electricity, Chemical Cells, Nuclear Power, Minerals, Plastics, Polymers, Nutrition, Drugs, Molecules of Life
And many more to be discovered

Recommended Reading:

Textbook:

Reference books:

Teaching pattern:

*Duration of course: one semester*
*Suggested lecture/tutorial/laboratory mix:*
Lectures: 26 H
Tutorials: 6 H
Laboratories: 20 H