

## Subject Description Form

<b>Subject Code</b>	ABCT1741
<b>Subject Title</b>	General Chemistry I
<b>Credit Value</b>	3
<b>Level</b>	1
<b>Pre-requisite</b>	HKDSE Chemistry/Combined Science with Chemistry component Level 3; or ABCT1700 Introduction to Chemistry; or ABCT1D01 Chemistry and Modern Living.
<b>Objectives</b>	<ul style="list-style-type: none"> <li>▪ To introduce a molecular perspective for understanding the natural world</li> <li>▪ To identify the fundamental principles underlying any physical and chemical changes of matters</li> <li>▪ To visualize the physical and chemical changes through the understanding of molecular behavior</li> </ul>
<b>Intended Learning Outcomes</b>	<p>Upon completion of the subject, students will be able to:</p> <ol style="list-style-type: none"> <li>a. Understand the macroscopic properties of the states of matters;</li> <li>b. Understand the basic principles of chemical energetics and equilibria;</li> <li>c. Apply and incorporate the chemical principles and knowledge learned to solve chemical problems and to appreciate modern applications in real life;</li> <li>d. Demonstrate the abilities in communication as well as skills in problem-solving and analytical thinking.</li> </ol>
<b>Contribution to Programme Outcomes (Refer to Part I Section 10)</b>	Programme Outcome 1: Demonstrate an ability to apply knowledge of mathematics, science, and engineering appropriate to the Biomedical Engineering (BME) discipline. (Teach)
<b>Subject Synopsis/ Indicative Syllabus</b>	<p><b>Measurement in Chemistry:</b> Significant figures; SI units; substances and mixtures; solution and concentration; mole and Avogadro's number; chemical reactions and balanced equations; and temperature scales.</p> <p><b>Principle of Chemical Equilibria:</b> law of chemical equilibrium and equilibrium constant; and Le Chatelier principle.</p> <p><b>Acid–Base Equilibria in Aqueous Solutions:</b> Ionization of water; pH, pOH, and pK<sub>w</sub>; acids and bases; polyprotic acids; buffers; and solubility equilibria.</p> <p><b>Solubility and Complex–Ion Equilibria:</b> Solubility constants and solubility; common ion effects; precipitation; and equilibria involving complex ions.</p> <p><b>Structures and Reactions of Organic Compounds:</b> Isomerisms; functional groups of organic compounds; nucleophilic substitution reactions; elimination reactions; addition reactions of alkenes; electrophilic aromatic substitution; reactions of alkanes; polymers; and polymerization reactions.</p>

<b>Teaching and Learning Methodology</b>	Lectures supplemented with guided reading will be used to introduce the key concepts of the topics. Home works or assignments would be given for students to enhance their learning. Tutorials will be arranged and students would be assigned in small groups for discussion.																																																																						
<b>Assessment Methods in Alignment with Intended Learning Outcomes</b>	<table border="1" data-bbox="472 398 1449 770"> <thead> <tr> <th data-bbox="472 398 783 566" rowspan="2">Specific assessment methods/tasks</th> <th data-bbox="783 398 946 566" rowspan="2">% weighting</th> <th colspan="6" data-bbox="946 398 1449 499">Intended subject learning outcomes to be assessed (Please tick as appropriate)</th> </tr> <tr> <th data-bbox="946 499 1029 566">a</th> <th data-bbox="1029 499 1112 566">b</th> <th data-bbox="1112 499 1195 566">c</th> <th data-bbox="1195 499 1278 566">d</th> <th data-bbox="1278 499 1361 566"></th> <th data-bbox="1361 499 1449 566"></th> </tr> </thead> <tbody> <tr> <td data-bbox="472 566 783 633">Continuous assessment</td> <td data-bbox="783 566 946 633">50%</td> <td data-bbox="946 566 1029 633">✓</td> <td data-bbox="1029 566 1112 633">✓</td> <td data-bbox="1112 566 1195 633">✓</td> <td data-bbox="1195 566 1278 633">✓</td> <td data-bbox="1278 566 1361 633"></td> <td data-bbox="1361 566 1449 633"></td> </tr> <tr> <td data-bbox="472 633 783 701">Examination</td> <td data-bbox="783 633 946 701">50%</td> <td data-bbox="946 633 1029 701">✓</td> <td data-bbox="1029 633 1112 701">✓</td> <td data-bbox="1112 633 1195 701">✓</td> <td data-bbox="1195 633 1278 701">✓</td> <td data-bbox="1278 633 1361 701"></td> <td data-bbox="1361 633 1449 701"></td> </tr> <tr> <td data-bbox="472 701 783 770">Total</td> <td data-bbox="783 701 946 770">100 %</td> <td colspan="6" data-bbox="946 701 1449 770"></td> </tr> </tbody> </table>								Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)						a	b	c	d			Continuous assessment	50%	✓	✓	✓	✓			Examination	50%	✓	✓	✓	✓			Total	100 %																															
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<b>Reading List and References</b>	<p data-bbox="472 1518 691 1559"><b><u>Essential reading</u></b></p> <p data-bbox="472 1585 1414 1659">Petrucci, Herring, Madura and Biossonnette, <i>General Chemistry: Principle and Modern Applications</i>, 10<sup>th</sup> edition, 2011, Pearson</p>																																																																						