

Enquiry for Course Details

CHEM1041 Foundations of chemistry (6 credits)		Academic Year	2023												
Offering Department	Chemistry	Quota	70												
Course Co-ordinator	Dr A P L Tong, Chemistry < apltong@hku.hk >														
Teachers Involved	(Dr A P L Tong, Chemistry)														
Course Objectives	The course aims to provide students who do not have HKDSE Chemistry or an equivalent background but are interested in exploring Chemistry further, with an understanding of the essential fundamental principles and concepts of chemistry.														
Course Contents & Topics	<p>Topic 1: Gases: Their Properties and Behaviour (6 hours) Gas pressure; the gas laws; the ideal gas law and reaction stoichiometry; the kinetic-molecular theory of gases.</p> <p>Topic 2: Chemical Bonding and Structures (7 hours) Covalent, ionic and metallic bonds; bond energy and chemical change; electronegativity and bond polarity; Lewis structures of molecules and ions; VSEPR Theory and molecular shape.</p> <p>Topic 3: Intermolecular Forces: Liquids, Solids, and Phase Changes (8 hours) Physical states and phase changes; types of intermolecular forces; properties of liquid state; the solid state: structure, properties, and bonding.</p> <p>Topic 4: Chemical Equilibrium (6 hours) The equilibrium state and the equilibrium constant; the equilibrium law: calculation of equilibrium constants and reaction quotient; Le Chatelier's Principle.</p> <p>Topic 5: Structures of Organic Compounds (9 hours) An overview of organic compounds and structures; organic nomenclature; stereoisomerism in organic compounds.</p>														
Course Learning Outcomes	<p>On successful completion of this course, students should be able to:</p> <table border="1"> <tr> <td>CLO 1</td> <td>demonstrate knowledge and understanding in relation to some chemical vocabulary, terminology and conventions</td> </tr> <tr> <td>CLO 2</td> <td>demonstrate knowledge and understanding of chemical stoichiometry, the properties of liquids and solids, the nature of gases, phase changes, chemical bonding and structures, and the nature of chemical equilibria</td> </tr> <tr> <td>CLO 3</td> <td>demonstrate a basic knowledge of organic compounds and structures, nomenclature, and isomerism in organic compounds</td> </tr> <tr> <td>CLO 4</td> <td>apply the theories and concepts introduced in the course to solve problems, perform calculations, make predictions and rationalize trends</td> </tr> <tr> <td>CLO 5</td> <td>organize and present chemical ideas in a clear, logical and coherent way</td> </tr> <tr> <td>CLO 6</td> <td>demonstrate awareness and appreciation of the relevant applications of chemistry in society and in everyday life</td> </tr> </table>			CLO 1	demonstrate knowledge and understanding in relation to some chemical vocabulary, terminology and conventions	CLO 2	demonstrate knowledge and understanding of chemical stoichiometry, the properties of liquids and solids, the nature of gases, phase changes, chemical bonding and structures, and the nature of chemical equilibria	CLO 3	demonstrate a basic knowledge of organic compounds and structures, nomenclature, and isomerism in organic compounds	CLO 4	apply the theories and concepts introduced in the course to solve problems, perform calculations, make predictions and rationalize trends	CLO 5	organize and present chemical ideas in a clear, logical and coherent way	CLO 6	demonstrate awareness and appreciation of the relevant applications of chemistry in society and in everyday life
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Pre-requisites (and Co-requisites and Impermissible combinations)	<p>Level 3 or above in HKDSE Combined Science with Chemistry component or Integrated Science, or equivalent. Students without such background but keen on taking this foundation chemistry course may approach the course coordinator for consideration.</p> <p>Not for students with Level 3 or above in HKDSE Chemistry or having taken any level 1 Chemistry course or above or any equivalent Chemistry course.</p>														
Course Status with Related Major/Minor /Professional Core	<p>2023 Major in Ecology & Biodiversity (Intensive) (Disciplinary Elective) 2022 Major in Ecology & Biodiversity (Intensive) (Disciplinary Elective) 2021 Major in Ecology & Biodiversity (Intensive) (Disciplinary Elective) 2020 Major in Ecology & Biodiversity (Intensive) (Disciplinary Elective) 2019 Major in Ecology & Biodiversity (Intensive) (Disciplinary Elective)</p>														
Course to PLO Mapping	<p>2023 Major in Ecology & Biodiversity (Intensive) < PLO 4 > 2022 Major in Ecology & Biodiversity (Intensive) < PLO 4 > 2021 Major in Ecology & Biodiversity (Intensive) < PLO 4 > 2020 Major in Ecology & Biodiversity (Intensive) < PLO 4 > 2019 Major in Ecology & Biodiversity (Intensive) < PLO 4 ></p>														
Offer in 2023 - 2024	Y 1st sem	Examination	Dec												
Offer in 2024 - 2025	Y														
Course Grade	A+ to F														

Grade Descriptors	A	Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show thorough grasp of the subject. Demonstrate strong analytical and critical abilities and logical thinking, with ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.		
	B	Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show substantial grasp of the subject. Demonstrate evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.		
	C	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show general but incomplete grasp of the subject. Demonstrate evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.		
	D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show partial but limited grasp, with retention of some relevant information, of the subject. Demonstrate evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.		
	Fail	Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Show evidence of little or no grasp of the knowledge and understanding of the subject. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.		
Course Type	Lecture-based course			
Course Teaching & Learning Activities	Activities	Details	No. of Hours	
	Lectures		36	
	Tutorials		12	
	Reading / Self study		100	
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping
	Assignments		30	CLO 1,2,3,4,5,6
	Examination		50	CLO 1,2,3,4,5,6
	Test		20	CLO 1,2,3,4,5,6
Required/recommended reading and online materials	<p>(Textbook for the course) Petrucci; Herring; Madura; Bissonnette: General Chemistry - Principles and Modern Applications, latest edition, Pearson.</p> <p>(Other reference books) Brown; LeMay; Bursten; Murphy; Woodward; Stoltzfus: Chemistry - The Central Science, latest edition, Pearson.</p> <p>Tro: Chemistry - A Molecular Approach, latest edition, Pearson.</p> <p>Robinson; McMurry; Fay: Chemistry, latest edition, Pearson.</p>			
Course Website	NIL			
Additional Course Information	Suggested follow-up course: CHEM1042 General Chemistry I			