Enquiry for Course Details

CHEM2241 Analytical chemistry I (6 credits)		Academic Year	2022
Offering Department	Chemistry	Quota	120
Course Co-ordinator	Dr I K Chu (1st sem); Dr E C M Tse (2nd sem), Chemistry < ivankchu@hku.hk; ecmtse@hku.hk >		
Teachers Involved	(Dr E C M Tse,Chemistry) (Dr I K Chu,Chemistry)		
Course Objectives	The course aims to introduce the basic principles of chemical analysis. The principles of chemical measurement, including error analysis, quality assurance and calibration, data acquisition and processing, will be discussed with reference to methods of chemical analysis that are based on chemical equilibrium and stoichiometric reactions. The laboratory classes will include experiments demonstrating modern approaches of data acquisition and processing as well as chemical analysis based on chemical equilibrium.		
Course Contents & Topics	Measurement: analog and digital measurement, accuracy and precision, comparing means and deviations, calibration curves and least square method for linear plots Quality assurance: validation of analytical procedures Chemical equilibrium and chemical analysis: aqueous solution and chemical equilibrium; analysis by acid-base reactivity, complexation reactivity, precipitation reactivity		
Course Learning Outcomes	On successful completion of this course, students should be able to: CLO 1 explain the basic principles of chemical measurements CLO 2 explain the principles of classical methods of chemical analysis such as acid-base neutralization CLO 3 use laboratory apparatus for chemical analysis		
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in CHEM1042; and Pass in CHEM1043, or already enrolled in this course		
Course Status with Related Major/Minor /Professional Core	2022 Major in Chemistry (Core/Compulsory) 2022 Major in Chemistry (Intensive) (Core/Compulsory) 2022 Major in Environmental Science (Disciplinary Elective) 2022 Minor in Chemistry (Disciplinary Elective) 2021 Major in Chemistry (Core/Compulsory) 2021 Major in Chemistry (Intensive) (Core/Compulsory) 2021 Major in Environmental Science (Disciplinary Elective) 2021 Minor in Chemistry (Disciplinary Elective) 2020 Major in Chemistry (Core/Compulsory) 2020 Major in Chemistry (Intensive) (Core/Compulsory) 2020 Major in Environmental Science (Disciplinary Elective) 2020 Minor in Chemistry (Disciplinary Elective) 2019 Major in Chemistry (Core/Compulsory) 2019 Major in Chemistry (Intensive) (Core/Compulsory) 2019 Major in Environmental Science (Disciplinary Elective) 2019 Minor in Chemistry (Disciplinary Elective) 2018 Major in Chemistry (Core/Compulsory) 2018 Major in Chemistry (Intensive) (Core/Compulsory) 2018 Major in Environmental Science (Disciplinary Elective) 2018 Minor in Chemistry (Disciplinary Elective)		
Course to PLO Mapping	2022 Major in Chemistry < PLO 2,3,4,5 > 2022 Major in Chemistry (Intensive) < PLO 2,3,4,5 > 2022 Major in Environmental Science < PLO 1,2,3 > 2021 Major in Chemistry < PLO 2,3,4,5 > 2021 Major in Chemistry (Intensive) < PLO 2,3,4,5 > 2021 Major in Environmental Science < PLO 1,2,3 > 2020 Major in Chemistry < PLO 2,3,4,5 > 2020 Major in Chemistry (Intensive) < PLO 2,3,4,5 > 2020 Major in Environmental Science < PLO 1,2,3 > 2019 Major in Chemistry < PLO 2,3,4,5 > 2019 Major in Chemistry (Intensive) < PLO 2,3,4,5 > 2019 Major in Environmental Science < PLO 1,2,3 > 2018 Major in Chemistry < PLO 2,3,4,5 > 2018 Major in Chemistry (Intensive) < PLO 2,3,4,5 > 2018 Major in Environmental Science < PLO 1,2,3 >		
Offer in 2022 - 2023	Y 1st sem 2nd sem	Examination	Dec May
Offer in 2023 - 2024	Y		
Course Grade	A+ to F		

Grade Descriptors

A	Demonstrate thorough grasp of the subject. Show evidence of strong analytical abilities, logical and independent thinking, and ablility to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Demonstrate highly proficient lab skills and techniques and critical use of data and results to draw appropriate and insightful conclusions. Demonstrate highly effective organization and presentation skills.
B	Demonstrate substantial grasp of the subject. Show evidence of analytical abilities and logical thinking, some evidence of independent thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Demonstrate proficient lab skills and techniques and correct use of data and results to draw appropriate conclusions. Demonstrate effective organization and presentation skills.
C	Demonstrate general but incomplete grasp of the subject. Show evidence of some analytical abilities and logical thinking, little evidence of independent thinking, and ability to apply knowledge to most familiar situations. Demonstrate adequate lab skills and techniques and mostly correct but some erroneous use of data and results to draw appropriate conclusions. Demonstrate moderately effective organization and presentation skills.
D	Demonstrate partial but limited grasp, with retention of some relevant information, of the subject. Show evidence of limited analytical abilities, little or no evidence of independent thinking, and limited ability to apply knowledge to solve problems. Demonstrate partially effective lab skills and techniques and limited ability to use data and results to draw appropriate conclusions. Demonstrate limited or barely effective organization and presentation skills.
Fail	Demonstrate little or no grasp of the knowledge and understanding of the subject. Show little or no evidence of analytical abilities, logical and independent thinking, and very little or no ability to apply knowledge to solve problems. Demonstrate minimally effective or ineffective lab skills and techniques and misuse of data and results and/or unable to draw appropriate conclusions. Demonstrate incoherent organization and poor presentation skills.

Course Type

Lecture with laboratory component course

Course Teaching & Learning Activities

Activities	Details	No. of Hours
Laboratory		24
Lectures		24
Tutorials		6
Reading / Self study		100

Assessment Methods and Weighting

Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping
Assignments		10	CLO 1,2
Examination		50	CLO 1,2
Laboratory reports		20	CLO 3
Test		20	CLO 1,2

Required/recommended reading and online materials

Skoog, West, Holler and Crouch, "Fundamentals of Analytical Chemistry", latest edition, Cengage Learning

Course Website

NIL

Additional Course Information

Laboratory classes are mandatory. Students must complete ALL experiments and laboratory reports to pass this course.