Enquiry for Course Details

CHEM4242 Analytical chemistry (6 credits)		Academic Year	2021
Offering Department	Chemistry	Quota	50
Course Co-ordinator	Dr K K H Ng, Chemistry < kkhn3@hku.hk >		
Teachers Involved	(Dr K K H Ng,Chemistry)		
Course Objectives	This course focuses on the basic principle, practice and methodology in chemical and biochemical analysis. The course emphasizes on the integration of analytical concepts and technologies to solve practical analytical and bioanalytical problems. This course will be particularly useful for students who plan to pursue their career related to analytical and bioanalytical chemistry.		
Course Contents & Topics	Analytical measurement concepts: Statistical treatment & evaluation of chemical measurement data; Figures of merits of analytical methods; Validation of analytical methods; Quality assurance in chemical analysis and testing laboratories Theoretical background and practical techniques of sample preparation, separation and detection: Sample preparation and enrichment techniques for biomedical, pharmaceutical and forensic chemical analysis; Advanced separation technologies for complex mixture analysis (e.g. multidimensional LC); Derivatization methods for chromatographic analysis and spectroscopic detection; Analytes characterization and detection techniques based on mass spectrometry Problem-based design of analytical strategy for chemical & biochemical analysis: Expert sharing of practical knowledge and experience related to selected fields of research; Case study and review of analytical chemistry literature/ scenario.		
Course Learning Outcomes	On successful completion of this course, students should be able to: CLO 1 apply statistical methods to assess analytical measurement data quality and interpret their significance, validate analytical methods and results CLO 2 demonstrate understanding on the working principle of different analytical techniques and recognize their advantages and limitations CLO 3 integrate different analytical techniques to solve analytical and bioanalytical problems		
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in CHEM3241 or CHEM3242		
Course Status with Related Major/Minor /Professional Core	2021 Major in Chemistry (Disciplinary Elective) 2021 Major in Chemistry (Intensive) (Disciplinary Elective) 2021 Minor in Chemistry (Disciplinary Elective) 2020 Major in Chemistry (Disciplinary Elective) 2020 Major in Chemistry (Intensive) (Disciplinary Elective) 2020 Minor in Chemistry (Disciplinary Elective) 2019 Major in Chemistry (Disciplinary Elective) 2019 Major in Chemistry (Intensive) (Disciplinary Elective) 2019 Minor in Chemistry (Disciplinary Elective) 2018 Major in Chemistry (Disciplinary Elective) 2018 Major in Chemistry (Intensive) (Disciplinary Elective) 2018 Minor in Chemistry (Disciplinary Elective) 2017 Major in Chemistry (Disciplinary Elective) 2017 Major in Chemistry (Intensive) (Disciplinary Elective) 2017 Minor in Chemistry (Disciplinary Elective)		
Course to PLO Mapping	2021 Major in Chemistry < PLO 2,3,4,5 > 2021 Major in Chemistry (Intensive) < PLO 2,3,4,5 > 2020 Major in Chemistry < PLO 2,3,4,5 > 2020 Major in Chemistry (Intensive) < PLO 2,3,4,5 > 2019 Major in Chemistry < PLO 2,3,4,5 > 2019 Major in Chemistry (Intensive) < PLO 2,3,4,5 > 2018 Major in Chemistry < PLO 2,3,4,5 > 2018 Major in Chemistry (Intensive) < PLO 2,3,4,5 > 2017 Major in Chemistry < PLO 2,3,4,5 > 2017 Major in Chemistry (Intensive) < PLO 2,3,4,5 >		
Offer in 2021 - 2022	Y 2nd sem	Examination	May
Offer in 2022 - 2023	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 strong analytical and critical abilities, logical thinking and capability to apply knowledge learnt to solve a wide range of complex issues and problems related to chemical analysis. Apply highly effective organization and presentation skills as shown in class work.
B	Demonstrate a substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities, logical thinking, and capability to apply knowledge learnt to solve a wide range of complex issues and problems related to chemical analysis. Apply effective organization and presentation skills as shown in class work.
C	Demonstrate a general command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of analytical and critical abilities, logical thinking, and ability to apply knowledge learnt to solve a wide range of complex issues and problems related to chemical analysis. Apply effective organization and presentation skills as shown in class work.
D	Demonstrate a partial but limited command of knowledge and skills required for attaining some of the course learning outcomes in Food and Water Analysis. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems related to chemical analysis. Apply limited or barely effective organization and presentation skill as shown in class work.
Fail	Demonstrate little or no evidence for the command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems related to chemical analysis. Organization and presentation skills are minimally effective or ineffective as shown in class work.

Course Type

Lecture with laboratory component course

Course Teaching & Learning Activities

Activities	Details	No. of Hours
Laboratory	6 x 4-hour of laboratory practical	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
Examination		60	CLO 1,2,3
Laboratory reports	Experiment & Lab report	15	CLO 1,2
Presentation		10	CLO 1,2,3
Test		15	CLO 1,2,3

Required/recommended reading and online materials

D.A. Skoog, D.M. West, F.J. Holler, S.R. Crouch: Fundamentals of Analytical Chemistry (Cengage Learning, latest edition)
A. Manz, P. S. Dittrich, N. Pamme, D. Iossifidis: Bioanalytical Chemistry (Imperial College Press, latest edition)
References to specialist texts and other published materials will be made throughout the course.

Course Website

NIL

Additional Course Information

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