

Enquiry for Course Details

CHEM4145 Medicinal chemistry (6 credits)		Academic Year	2023
Offering Department	Chemistry	Quota	40
Course Co-ordinator	Dr Y Li, Chemistry < yingli0e@hku.hk >		
Teachers Involved	(Dr P H Toy, Chemistry) (Dr Y Li, Chemistry) (Prof X C Li, Chemistry)		
Course Objectives	This course covers the chemical principles of drug design and drug action and uses as an introduction to research in areas of bioorganic chemistry, bioinorganic chemistry, medicinal chemistry, pharmaceutical chemistry, and biotechnology.		
Course Contents & Topics	<ul style="list-style-type: none"> - Drug discovery, design, and development: lead discovery, pharmacophore, structure-activity relationships (SAR), computer-aided drug design, combinatorial chemistry and high-throughput drug screening - Drug-receptor interactions - Proteins (and enzymes) and nucleic acids as drug targets - Metals in medicine - DNA-Drug interactions - Drug metabolism and prodrugs and drug delivery 		
Course Learning Outcomes	On successful completion of this course, students should be able to:		
	CLO 1	demonstrate knowledge of drug discovery, design and development	
	CLO 2	understand drug-biomolecule interactions where appropriate	
	CLO 3	gain appropriate knowledge of drug metabolism and drug delivery	
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in CHEM3441 or CHEM3442; and Not for students who have passed in BPHM3133, or already enrolled in this course.		
Course Status with Related Major/Minor /Professional Core	2023 Major in Biochemistry (Disciplinary Elective) 2023 Major in Chemistry (Disciplinary Elective) 2023 Major in Chemistry (Intensive) (Disciplinary Elective) 2023 Minor in Chemistry (Disciplinary Elective) 2022 Major in Biochemistry (Disciplinary Elective) 2022 Major in Chemistry (Disciplinary Elective) 2022 Major in Chemistry (Intensive) (Disciplinary Elective) 2022 Minor in Chemistry (Disciplinary Elective) 2021 Major in Biochemistry (Disciplinary Elective) 2021 Major in Chemistry (Disciplinary Elective) 2021 Major in Chemistry (Intensive) (Disciplinary Elective) 2021 Minor in Chemistry (Disciplinary Elective) 2020 Major in Biochemistry (Disciplinary Elective) 2020 Major in Chemistry (Disciplinary Elective) 2020 Major in Chemistry (Intensive) (Disciplinary Elective) 2020 Minor in Chemistry (Disciplinary Elective) 2019 Major in Biochemistry (Disciplinary Elective) 2019 Major in Chemistry (Disciplinary Elective) 2019 Major in Chemistry (Intensive) (Disciplinary Elective) 2019 Minor in Chemistry (Disciplinary Elective)		
Course to PLO Mapping	2023 Major in Biochemistry < PLO 1,2,3,4,5 > 2023 Major in Chemistry < PLO 2,3,4 > 2023 Major in Chemistry (Intensive) < PLO 2,3,4 > 2022 Major in Biochemistry < PLO 1,2,3,4,5 > 2022 Major in Chemistry < PLO 2,3,4 > 2022 Major in Chemistry (Intensive) < PLO 2,3,4 > 2021 Major in Biochemistry < PLO 1,2,3,4,5 > 2021 Major in Chemistry < PLO 2,3,4 > 2021 Major in Chemistry (Intensive) < PLO 2,3,4 > 2020 Major in Biochemistry < PLO 1,2,3,4,5 > 2020 Major in Chemistry < PLO 2,3,4 > 2020 Major in Chemistry (Intensive) < PLO 2,3,4 > 2019 Major in Biochemistry < PLO 1,2,3,4,5 > 2019 Major in Chemistry < PLO 2,3,4 > 2019 Major in Chemistry (Intensive) < PLO 2,3,4 >		
Offer in 2023 - 2024	Y	2nd sem	Examination May
Offer in 2024 - 2025	Y		
Course Grade	A+ to F		

Grade Descriptors	A	Demonstrate thorough knowledge and understanding of essential facts, concepts, principles, and theories relating to the basic foundation knowledge of medicinal chemistry, especially those related to drug discovery, design and development; drug targets; drug lead optimization; structure activity relationship; pharmacokinetics; drug delivery and its relevance to toxicity. Show strong ability to apply and integrate knowledge and theory relating to the basic foundation knowledge of medicinal chemistry. Show strong ability to analyze novel problems and critical use of data and experimental results to draw appropriate and insightful conclusions relating to the basic principles and knowledge of medicinal chemistry. Demonstrate highly effective basic techniques for medicinal chemistry, especially in drug discovery and metabolism.		
	B	Demonstrate substantial command of knowledge and understanding of essential facts, concepts, principles, and theories relating to the basic foundation knowledge of medicinal chemistry; especially those related to drug discovery; design and development; drug targets; drug lead optimization; structure activity relationship; pharmacokinetics; drug delivery and its relevance to toxicity. Show evidence to apply and integrate knowledge and theory relating to the basic foundation knowledge of medicinal chemistry. Show evidence to analyze novel problems and correct use of data and experimental results to draw appropriate conclusions relating to the basic principles and knowledge of medicinal chemistry. Demonstrate effective basic techniques for medicinal chemistry, especially in drug discovery and metabolism.		
	C	Demonstrate general but incomplete command of knowledge and understanding of essential facts, concepts, principles, and theories relating to the basic foundation knowledge of medicinal chemistry; especially those related to drug discovery; design and development; drug targets; drug lead optimization; structure activity relationship; pharmacokinetics; drug delivery and its relevance to toxicity. Show evidence of some abilities to apply and integrate knowledge and theory relating to the basic foundation knowledge of medicinal chemistry. Show ability to analyze problems to most familiar situations and mostly correct but erroneous use of data and experimental results to draw appropriate conclusions relating to the basic principles and knowledge of medicinal chemistry. Demonstrate moderately effective basic techniques, basic techniques for medicinal chemistry, especially in drug discovery and metabolism.		
	D	Demonstrate partial but limited command of knowledge and understanding of essential facts, concepts, principles, and theories relating to the basic foundation knowledge of medicinal chemistry; especially those related to drug discovery; design and development; drug targets; drug lead optimization; structure activity relationship; pharmacokinetics; drug delivery and its relevance to toxicity. Show evidence of limited abilities to apply and integrate knowledge and theory relating to the basic foundation knowledge of medicinal chemistry. Show limited ability to analyze problems to most familiar situations and mostly correct but erroneous use of data and experimental results to draw appropriate conclusions relating to the basic principles and knowledge of medicinal chemistry. Demonstrate partially effective basic techniques for medicinal chemistry, especially in drug discovery and metabolism.		
	Fail	Demonstrate little or no evidence of command of knowledge and understanding of essential facts, concepts, principles, and theories relating to the basic foundation knowledge of medicinal chemistry; especially those related to drug discovery; design and development; drug targets; drug lead optimization; structure activity relationship; pharmacokinetics; drug delivery and its relevance to toxicity. Show little or no evidence of abilities to apply and integrate knowledge and theory relating to the basic foundation knowledge of medicinal chemistry. Show little or no ability to analyze problems to most familiar situations and erroneous use of data and experimental results to draw appropriate conclusions relating to the basic principles and knowledge of medicinal chemistry. Demonstrate minimally effective basic techniques for medicinal chemistry, especially in drug discovery and metabolism.		
Course Type	Lecture-based course			
Course Teaching & Learning Activities	Activities	Details	No. of Hours	
	Lectures		36	
	Tutorials	or discussion	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
	Examination		50	CLO 1,2,3
	Test	(mid-term test)	20	CLO 1,2,3
Required/recommended reading and online materials	An Introduction to Medicinal Chemistry (3/e), G.L. Patrick, Oxford University Press, 2005 Medicinal Chemistry- An Introduction, G. Thomas, John Wiley, 2000 D. Wang, S.J. Lippard (2004) Nat. Rev. Drug Dis., Cellular processing of platinum anticancer drugs, 4, 307-320			
Course Website	NIL			
Additional Course Information	This course is also offered to RPg students, and the course code for RPg students is CHEM6113.			