

Enquiry for Course Details

CHEM4342 Organometallic chemistry (6 credits)		Academic Year	2022								
Offering Department	Chemistry	Quota	32								
Course Co-ordinator	Dr. J Z Liu, Chemistry < juliu@hku.hk >										
Teachers Involved	(Dr J He, Chemistry) (Dr. J Z Liu, Chemistry)										
Course Objectives	To give further, more detailed, treatment to organometallic chemistry mentioned in CHEM3341 Inorganic Chemistry II. The course also aims to introduce and familiarize students with advanced laboratory techniques, and to prepare students for graduate work in inorganic and organometallic chemistry.										
Course Contents & Topics	<p>Lectures: Main group and transition metal organometallics. Transition metal cluster chemistry. Bonding, structure and reactivities of organometallics. Application of organometallics in organic synthesis and catalysis.</p> <p>Laboratory: To introduce and familiarize students with advanced laboratory techniques which include the synthesis and manipulation of air- and moisture- sensitive compounds, and their characterization by various spectroscopic methods.</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>understand the advanced principles and concepts in organometallic chemistry</td> </tr> <tr> <td>CLO 2</td> <td>demonstrate knowledge and understanding in the bonding, structure and reactivities of main group and transition metal organometallics, especially in transition metal clusters, metal alkyls, metal alkylidenes and metal alkylidyne</td> </tr> <tr> <td>CLO 3</td> <td>demonstrate knowledge and understanding in the application of organometallics in organic synthesis, polymerization and catalysis</td> </tr> <tr> <td>CLO 4</td> <td>demonstrate ability in advanced laboratory techniques including the synthesis and manipulation of air- and moisture- sensitive compounds, and their characterization by various spectroscopic methods</td> </tr> </table>			CLO 1	understand the advanced principles and concepts in organometallic chemistry	CLO 2	demonstrate knowledge and understanding in the bonding, structure and reactivities of main group and transition metal organometallics, especially in transition metal clusters, metal alkyls, metal alkylidenes and metal alkylidyne	CLO 3	demonstrate knowledge and understanding in the application of organometallics in organic synthesis, polymerization and catalysis	CLO 4	demonstrate ability in advanced laboratory techniques including the synthesis and manipulation of air- and moisture- sensitive compounds, and their characterization by various spectroscopic methods
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Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in CHEM3341										
Course Status with Related Major/Minor /Professional Core	2022 Major in Chemistry (Disciplinary Elective) 2022 Major in Chemistry (Intensive) (Disciplinary Elective) 2022 Minor in Chemistry (Disciplinary Elective) 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)										
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Offer in 2022 - 2023	Y	1st sem	Examination Dec								
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Course Grade	A+ to F										

Grade Descriptors	<table border="1"> <tr> <td data-bbox="399 77 500 264">A</td> <td data-bbox="500 77 1516 264">Demonstrate thorough knowledge and understanding of essential facts, concepts, principles, and theories relating to the more detailed and advanced treatment of organometallic chemistry, especially those related to structure, bonding and reactivities of main group and transition metal organometallics; transition metal cluster chemistry; and application of organometallics in organic synthesis and catalysis. Show strong ability to apply and integrate knowledge and theory relating to the advanced principles and concepts of organometallic 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 advanced principles and applications of organometallic chemistry. 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Course Teaching & Learning Activities	<table border="1"> <thead> <tr> <th data-bbox="399 1083 987 1115">Activities</th> <th data-bbox="987 1083 1321 1115">Details</th> <th data-bbox="1321 1083 1516 1115">No. of Hours</th> </tr> </thead> <tbody> <tr> <td data-bbox="399 1115 987 1157">Laboratory</td> <td data-bbox="987 1115 1321 1157"></td> <td data-bbox="1321 1115 1516 1157">30</td> </tr> <tr> <td data-bbox="399 1157 987 1199">Lectures</td> <td data-bbox="987 1157 1321 1199"></td> <td data-bbox="1321 1157 1516 1199">24</td> </tr> <tr> <td data-bbox="399 1199 987 1241">Tutorials</td> <td data-bbox="987 1199 1321 1241"></td> <td data-bbox="1321 1199 1516 1241">5</td> </tr> <tr> <td data-bbox="399 1241 987 1283">Reading / Self study</td> <td data-bbox="987 1241 1321 1283"></td> <td data-bbox="1321 1241 1516 1283">100</td> </tr> </tbody> </table>	Activities	Details	No. of Hours	Laboratory		30	Lectures		24	Tutorials		5	Reading / Self study		100					
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Required/recommended reading and online materials	R. H. Crabtree: The Organometallic Chemistry of the Transition Metals (Wiley, 2005, 4th ed.) C. Elschenbroich and A. Salzer: Organometallics - A Concise Introduction (VCH, 1992, 2nd revised edition) Reference 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.																				