

Enquiry for Course Details

CHEM4342 Organometallic chemistry (6 credits)		Academic Year	2021								
Offering Department	Chemistry	Quota	40								
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	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)										
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Offer in 2021 - 2022	Y 1st sem	Examination	Dec								
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Course Grade	A+ to F										

Grade Descriptors	<table border="1"> <tr> <td data-bbox="397 80 496 259">A</td> <td data-bbox="496 80 1498 259">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="397 1061 970 1093">Activities</th> <th data-bbox="970 1061 1299 1093">Details</th> <th data-bbox="1299 1061 1498 1093">No. of Hours</th> </tr> </thead> <tbody> <tr> <td data-bbox="397 1093 970 1131">Laboratory</td> <td data-bbox="970 1093 1299 1131"></td> <td data-bbox="1299 1093 1498 1131">30</td> </tr> <tr> <td data-bbox="397 1131 970 1169">Lectures</td> <td data-bbox="970 1131 1299 1169"></td> <td data-bbox="1299 1131 1498 1169">24</td> </tr> <tr> <td data-bbox="397 1169 970 1207">Tutorials</td> <td data-bbox="970 1169 1299 1207"></td> <td data-bbox="1299 1169 1498 1207">5</td> </tr> <tr> <td data-bbox="397 1207 970 1245">Reading / Self study</td> <td data-bbox="970 1207 1299 1245"></td> <td data-bbox="1299 1207 1498 1245">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	<p>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.</p>																				
Course Website	NIL																				
Additional Course Information	Laboratory classes are mandatory. Students must complete ALL experiments and laboratory reports to pass this course.																				