



UNIVERSITI TEKNOLOGI MARA

CHM624: ADVANCED ORGANIC CHEMISTRY

Course Name (English)	ADVANCED ORGANIC CHEMISTRY APPROVED
Course Code	CHM624
MQF Credit	3
Course Description	This course is an introduction to selectivity in organic synthesis, definition, chemoselectivity, regioselectivity, stereoselective reactions of carbonyl compounds, stereoselective reactions of alkenes (Diels Alder reaction), protective groups in synthesis, carbon-carbon bond formation such as alkylation of enolates, enamines and hydrazones, Wittig reactions, Peterson olefination. The course also covers synthetic approaches of the total synthesis of some biological active molecules such as morphine and retronecine.
Transferable Skills	Writing mechanism for electrophilic addition and electrophilic aromatic substitution reactions. Writing mechanism for nucleophilic addition of carbonyl compounds and nucleophilic acyl substitution of carboxylic acids and their derivatives. Interconverting functional groups learned in Organic Chemistry I and II courses. Writing organic laboratory reports Using glassware and setting up apparatus for distillation and reflux processes in laboratory. Analyzing NMR and IR spectroscopic data.
Teaching Methodologies	Lectures, Lab Work
CLO	CLO1 Discuss the concepts in selectivity in organic chemistry, oxidation, reduction, protecting groups and carbon-carbon bond formation. CLO2 To describe processes involved in the syntheses of complex molecules by applying the concepts of organic chemistry. CLO3 To perform laboratory experiments related to Wittig reaction, Friedel-Crafts acylation and oxidation reaction. CLO4 Demonstrate communication skills related to Wittig reaction, Friedel-Crafts acylation and oxidation reaction.
Pre-Requisite Courses	No course recommendations
Topics	
1. Selectivity in Organic Chemistry 1.1) Definition of selectivity 1.2) Chemoselectivity 1.3) Regioselectivity 1.4) Stereoselectivity	
2. Oxidation 2.1) Metal Based Reagents 2.2) Non-Metal Based Reagents 2.3) Epoxidations	
3. Reductions 3.1) Hydrogenation 3.2) Boron Reagents 3.3) Aluminium reagents	
4. Protecting groups 4.1) Hydroxyl Compounds 4.2) Ketones and Aldehydes 4.3) Amines	

5. Carbon-carbon Bond Formation

5.1) C-C Bond formation

5.2) C=C Bond formation

6. Total Synthesis of Natural Products (retronecine).

6.1) Different strategic approaches

Assessment Breakdown	%
Continuous Assessment	50.00%
Final Assessment	50.00%

Details of Continuous Assessment	Assessment Type	Assessment Description	% of Total Mark	CLO
	Assignment	One assignment	10%	CLO2
	Lab Exercise	Lab skill	5%	CLO3
	Test	One test	20%	CLO1
	Written Report	One lab report	15%	CLO4

Reading List	Recommended Text	<ul style="list-style-type: none"> T. W. Graham Solomons, Craig B. Fryhle 2011, <i>Organic Chemistry</i>, 10 Ed., 25, John Wiley & Sons USA [ISBN: 9780470524596]
	Reference Book Resources	<ul style="list-style-type: none"> Randall G. Engel, Donald L. Pavia, Gary M. Lampman, George S. Kriz, <i>Introduction to Organic Laboratory Techniques</i>, 3 Ed., 7 [ISBN: 9780538733281] Robert S. Ward 1999, <i>Selectivity in Organic Synthesis</i>, 9, Wiley [ISBN: 0471987794] M. Nógrádi 1995, <i>Stereoselective Synthesis: A Practical Approach</i>, 2 Ed., 8, Wiley-VCH [ISBN: 3527292438]

Article/Paper List	This Course does not have any article/paper resources
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Other References	This Course does not have any other resources
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