



UNIVERSITI TEKNOLOGI MARA

CHM471: PHYSICAL CHEMISTRY I

Course Name (English)	PHYSICAL CHEMISTRY I APPROVED
Course Code	CHM471
MQF Credit	3
Course Description	This course is an introductory course to physical chemistry. It will interactively engage students in areas of thermochemistry, kinetics, phase equilibrium, colloid and surface chemistry. Lecture sessions employ a mixture of lectures and problem based learning. Students will define concepts and perform investigations via laboratory exercises. Results of lab investigations leading to its relation to existing laws, principles or theories will also be discussed in the lecture sessions.
Transferable Skills	Knowledge, critical thinking and practical skills.
Teaching Methodologies	Lectures, Blended Learning, Lab Work, Discussion
CLO	<p>CLO1 Explain the concepts in thermochemistry, kinetics, phase equilibrium, colloid and surface chemistry.</p> <p>CLO2 Solve problems concerning the concepts in thermochemistry, kinetics, phase equilibrium, colloid and surface chemistry.</p> <p>CLO3 Conduct scientific investigation in areas on thermochemistry, kinetics, phase equilibrium, colloid and surface chemistry.</p> <p>CLO4 Report on experimental findings in areas on thermochemistry, kinetics, phase equilibrium, colloid and surface chemistry in a scientific manner</p>
Pre-Requisite Courses	No course recommendations
Topics	
1. THERMOCHEMISTRY 1.1) Exothermic and endothermic reactions 1.2) Enthalpy and enthalpy change 1.3) Calorimetry 1.4) Hess's Law	
2. KINETICS 2.1) Rates of reaction 2.2) Factors affecting rates of reaction 2.3) Rate Law and order of reaction 2.4) Methods to determine order of reactions 2.5) Relation between rate and temperature 2.6) Reaction mechanism 2.7) Catalytic kinetics	
3. PHASE EQUILIBRIUM 3.1) Definition - component, phase and degree of freedom 3.2) One component system - water and carbon dioxide system 3.3) Two component system - Raoult's law, colligative properties, ideal, negative and positive deviation from Raoult's law solutions, azeotropic mixtures and eutectic mixtures	
4. COLLOID 4.1) Definition - true solution, colloid and heterogeneous system 4.2) Types of colloid and uses 4.3) Lyophobic and lyophilic colloid - stability, preparation and property	

5. ADSORPTION

- 5.1) Definition - adsorption
- 5.2) Types of adsorption
- 5.3) Physical and chemical adsorption
- 5.4) Gibbs equation
- 5.5) Isotherm - Langmuir, Freundlich and BET

Assessment Breakdown	%
Continuous Assessment	60.00%
Final Assessment	40.00%

Details of Continuous Assessment	Assessment Type	Assessment Description	% of Total Mark	CLO
	Practical	Lab skills	5%	CLO3
	Test	Tests 1	20%	CLO2
	Test	Test 2	20%	CLO1
	Written Report	Writing lab reports	15%	CLO4

Reading List	Recommended Text	<ul style="list-style-type: none"> Peter Atkins,Julio de Paula 2014, <i>Atkins' Physical Chemistry</i>, 10th ed Ed., 22, Oxford University Press UK [ISBN: 9780199697403]
	Reference Book Resources	<ul style="list-style-type: none"> Keith James Laidler,John H. Meiser,Bryan C. Sanctuary 2003, <i>Physical Chemistry</i>, 4th ed Ed., 19, Brooks/Cole Publishing Company [ISBN: 0618123415] Raymond Chang,Kenneth Goldsby 2012, <i>Chemistry</i>, 11th ed Ed., McGraw-Hill Science/Engineering/Math USA [ISBN: 0073402680] Steven S. Zumdahl,Susan A. Zumdahl 2013, <i>Chemistry</i>, 9th ed Ed., Brooks/Cole Publishing Company USA [ISBN: 1285188497] Ira Levine 2008, <i>Physical Chemistry</i>, 6th ed Ed., 23, McGraw Hill, USA USA [ISBN: 978007253862] Kenneth Whitten,Raymond Davis,Larry Peck,George Stanley 2013, <i>Chemistry</i>, 10th ed Ed., 28, Brooks/Cole, Cengage Learning USA [ISBN: 1133610668]
Article/Paper List	This Course does not have any article/paper resources	
Other References	This Course does not have any other resources	