

SUMMARY OF INFORMATION ON EACH COURSE

1.	Name of Course	General Chemistry							
2.	Course Code	PGC 0225							
3.	Status of Course [Applies to (cohort)]	Core for Foundation in Life Sciences							
4.	MQF Level/Stage Note : Certificate – MQF Level 3 Diploma – MQF Level 4 Bachelor – MQF Level 6 Masters – MQF Level 7 Doctoral – MQF Level 8	Foundation (Certificate – MQF Level 3)							
5.	Version (State the date of the Senate approval – history of previous and current approval date)	Date of previous version :		October 2011		Date of current version :		June 2014	
6.	Pre-Requisite	None							
7.	Name(s) of academic/teaching staff	Ho Sew Tiep Radziah Shaikh Abdullah Leonard Yew Chi Boon							
8.	Semester and Year offered	Trimester 2							
9.	Objective of the course in the programme : To expose students to fundamental principles of physical and inorganic chemistry with special emphasis on the core concepts, basic principles and methods of chemistry.								
10.	Justification for including the course in the programme : To provide fundamental knowledge and skills required for further learning in the field of the Life Sciences.								
11.	Course Learning Outcomes :							Domain	Level
	LO1	State the fundamental principles of physical and inorganic chemistry.						Cognitive	1
	LO2	Illustrate chemical reactions and the use of quantitative aspects of general chemistry.						Cognitive	2
	LO3	Interpret the laws, principles, concept and theories of chemistry in relevant topics.						Cognitive	2
	LO4	Explain various basic applications of bonds and periodicity.						Cognitive	2
12.	Mapping of Learning Outcomes to Programme Outcomes :								
	Learning Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
	LO1	X	X						
	LO2	X	X						
	LO3	X	X						
LO4	X	X							

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13.	Assessment Methods and Types :					
	Method and Type		Description/Details		Percentage	
	1	Quiz	Quizzes with short structured questions or MCQ		10	
	2	Assignment	Assignments with short structured questions		10	
	3	Lab Reports	Lab reports with short structured questions		10	
	4	Test	Written examination		20	
5	Final Examination	Written examination		50		
14.	Mapping of assessment components to learning outcomes (LOs)					
	Assessment Components		LO1	LO2	LO3	LO4
	Quiz		12.5	10		14.3
	Assignment			10	12.5	14.3
	Lab Reports			10		
	Test		25.0	20	25.0	
	Final Examination		62.5	50	62.5	71.4
Total		100	100	100	100	
15.	Details of Course					
	Topics		Mode of Delivery (eg : Lecture, Tutorial, Workshop, Seminar, etc.) Indicate allocation of SLT (lecture, tutorial, lab) for each subtopic			
			Lecture	Tutorial	Lab	
	The Components of Matter and Stoichiometry Elements, Compounds and Mixtures, An atomic View of Matter, Dalton's Atomic Theory, The Atomic Theory Today, Compounds; Formulas, Names, and Masses, Mixtures: Classification and Separation, The Mole, Determining the Formula of an Unknown Compound, Writing and Balancing Chemical Equations, Calculating Amounts of Reactant and Product		3	1		
	The Major Classes of chemical Reactions The Role of Water as a Solvent, Writing Equation for Aqueous Ionic Reactions, Precipitation Reactions, Acid-Base Reactions, Oxidation-Reduction (Redox) Reactions, Reversible Reactions		3	1		
	Thermochemistry: Energy Flow and Chemical Change Forms of Energy and Their Interconversion, Entalpy: Heats of reaction and Chemical Change, Calorimetry, Stoichiometry of Thermochemical Equation, Standard Enthalpy of Formation and Reaction		3	1	2	
Atomic Structure and Chemical Periodicity Atomic Spectra, The Quantum-Mechanical Model of the Atom, Characteristics of Many-Electron Atoms, The Quantum-Mechanical Model and the Periodic Table, Trends in Three Key Atomic Properties, Atomic Structure and Chemical Periodicity		4	1			

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Chemical Bonding				
Atomic Properties and Chemical Bonds, The Ionic Bonding model, The Covalent Bonding Model, Between the Extremes: Electronegativity and Bond Polarity, An Introduction to Metallic Bonding, Depicting Molecules and Ions With Lewis Structure, Valence-Shell Electron-Pair Repulsion (VSEPR) Theory and Molecular Shape, Valence Bond (VB) Theory and Orbital Hybridization		3	2	
Intermolecular Forces: Liquids, Solids and Phase Changes				
An Overview of Physical States And Phase Changes, Quantitative Aspects of Phase Changes, Types of Intermolecular Forces, Properties of Liquid State, The Solid State: Structure, and Properties		3	1	
Kinetics and Equilibrium				
Factors That Influence Reaction Rate, Expressing The Reaction rate, The Rate Law And Its Components, Integrated Rate Law: Concentration Changes Over Time, Catalysis, The Dynamic Nature Of The Equilibrium State, Expressing Equilibria With Pressure Terms: Relation Between K_c And K_p , Reaction Conditions And The Equilibrium State: Le Châtelier's Principles		3	1	4
Acid-Base Equilibria				
Acids and Bases in Water, The pH Scale, The Brønsted-Lowry Acid-Base Definition, Solving Problems Involving Weak-Acid Equilibria, Molecular Properties and Acid Strength , Acid-Base Properties of Salt Solutions, The Lewis Acid-Base Definition, Acid dissociation constant, pK_a , and the relative strength of acids and bases, Henderson-Hasselbalch equation		3	1	2
Total		25	9	8
	Total Student Learning Time (SLT)	Face to Face / Guided Learning		Independent Learning
	Lecture	25		25
	Tutorials	9		9
	Laboratory/Practical	8		4
	Presentation	0		0
	Assignment	-		10
	Mid Term Test	1		4
	Final Exam	2		20
	Quizzes	3 times		3
	Sub Total	45		75
	Total SLT	120		
16.	Credit Value	3		
17.	Reading Materials :			

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Textbooks
1. Chang, R. & Goldsby, K.A. (2013). Chemistry (11th Ed). New York: McGraw-Hill.
Reference Material (including 'Statutes' for Law)
1. Chang, R. & Goldsby, K.A. (2014). General Chemistry: the Essential Concepts (7th Ed). McGraw-Hill Education.
2. Tro, N.J. (2015). Introductory Chemistry (5th Ed). Pearson.
3. Timberlake, K.C. & Timberlake, W. (2014). Basic Chemistry (4th Ed). Pearson Education Inc.
4. Brown, T.L., LeMay, H.E., Bursten, B.E., Murphy, C.J. & Woodward, P.M. (2012). Chemistry the Central Science (12th Ed). Prentice-Hall.
5. Silberberg, M.S. (2013). Chemistry: the Molecular Nature of Matter and Change (6th Ed – Global Edition). McGraw-Hill Education.
6. Petrucci, R.H., Herring, F.G., Madura, J.D. & Bissonnette, C. (2011). General Chemistry: Principles and Modern Applications (10th Ed). Pearson Canada Inc.

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Appendix (to be compiled when submitting the complete syllabus for the programme) :

1. Mission and Vision of the University and Faculty
2. Programme Objectives or Programme Educational Objectives
3. Programme Outcomes (POs)
4. Mapping of POs to the 8 MQF domain
5. Summary of the Bloom's Taxonomy's Domain Coverage in all the Los in the format below :

Subject	Learning Outcomes (please state the learning Outcomes)	Bloom's Taxonomy Domain		
		Affective	Cognitive	Psychomotor
ABC1234	Learning Outcome 1			
	Learning Outcome 2			
	Learning Outcome 3			
	Learning Outcome 4			
DEF5678	Learning Outcome 1			
	Learning Outcome 2			
	Learning Outcome 3			
	Learning Outcome 4			

6. Summary of LO to PO measurement
7. Measurement and Tabulation of result for LO achievement
8. Measurement Tabulation of result for PO achievement