Perancangan Mengajar **FAKULTI KEJURUTERAAN MEKANIKAL** **UNIVERSITI TEKNIKAL MALAYSIA MELAKA**		
CHEMISTRY		
DMCU 1233	**SEMESTER 1**	**SESI 2014/2015**

1.0 LEARNING OUTCOMES

Upon completion of this course, the student should be able to:

a. Recall the relevant chemistry principle studied. (C)
b. Explain verbally and writing the different chemical reactions, the differences in the reactivity of various elements, the nature of various chemical properties and chemical reactions and the factors affecting chemical properties and chemical reaction. (C)
c. Solve chemistry related problem by applying the relevant chemical principles. (C)
d. Demonstrate the relevant chemistry laboratory skills. (P, A)
e. Apply the various chemical properties learned to discuss the solution for relevant mechanical engineering problems. (C)

2.0 SYNOPSIS

This course will discuss about the concepts in Chemistry: The Study of Change; Atoms, Molecules and Ions; Chemical Reaction; Structure of Atoms; The Periodic Table; Chemical Bonding; Properties of Matter; and Thermochemistry.

3.0 REFERENCES

a. Chang, Raymond, 2013, *Chemistry,* 12th Ed. McGraw Hill, USA.
b. N. J. Tro, 2009, *Introductory Chemistry*, 3rd Ed. Pearson Education International.
c. Petrucci, R. H. and Hill J. W., 2002, *General Chemistry: An Integrated Approach,* Prentice Hall, USA.
d. Halimaton Hamdan, et.al., 2001, *Kimia Asas Sains dan Kejuruteraan,* Johor Bahru.

4.0 COURSE IMPLEMENTATIONS

a. Lectures – 2 hours per week for 13 weeks (Total = 26 hours)
b. Tutorials – 3 hours per week for 7 weeks (Total = 21 hours)
c. Laboratory – 3 hours per week for 5 weeks (Total = 15 hours)
   There are 5 laboratory sessions throughout this course.
   The laboratory session covers topics:
   - Lab 1: Usage and Calibrate of Lab Glassware Equipment
   - Lab 2: Density of liquid and Solid
   - Lab 3: Preparation and Standardization of Solution
   - Lab 4: Vinegar Analysis
   - Lab 5: Boyle`s Law

5.0 COURSE INSTRUCTIONS

Attendance is compulsory for lectures/tutorials/laboratories and should be more than 80% of the total contact hours. Students must wear shoe during laboratories sessions. The lecturer/lab assistant has the authority to ban the students from attending laboratories sessions in the case of failure to wear safety shoe. There will be no replacement for laboratories session unless a valid medical certificate (MC) is presented.

6.0 COURSE EVALUATIONS

	CRITERIA	PERCENTAGE (%)
COURSE WORK		
Tests	1 Test (1 hour/test)	15
Lab Report	5 Experiments (3 hours/Experiment)	20
Quizzes	2 Quizzes (15 minutes/quiz)	10
Assignment	1 Assignment (group) (2 hours preparation)	15
Final Exam	2 hours	40
TOTAL		**100**

7.0 COURSE CONTENT

Week	Section	Contents	Remarks
One 08/09/2014 – 12/09/2014	**Introduction**	**Introduction** (a) Syllabus (b) Coursework (c) Assessment	Lab Briefing Guided Study
Two 15/09/2014 – 19/09/2014	**Chapter 1: Chemistry: The Study of Change**	**Chapter 1: Chemistry The Study of Change** (a) Introduction (b) Classifications of matter (c) Physical & chemical properties of matter (d) Measurement (SI Units, mass & weight, volume, density, temperature scales) (e) Handling numbers (Scientific notation, significant figures) (f) Factor label method of solving problems	Tutorial 1 *Malaysia Day*
Three 22/09/2014 – 26/09/2014	**Chapter 2: Atoms, Molecules and Ions**	**Chapter 2: Atoms, Molecules and Ions** (a) The structure of the atom (b) Atomic number, mass number and isotopes, molecules and ions (c) Chemical formulas (d) Naming compounds (Ionic compound, molecular compound, acids and bases, and organic compounds)	Lab 1

Four 29/09/2014 – 03/10/2014	**Chapter 3: Chemical Reaction**	**Chapter 3: Chemical Reaction** (a) Atomic mass, molar mass of an element and molecular (b) Avogadro's number (c) Percent composition of compounds (d) Empirical and molecular formulas (e) Chemical reactions and chemical equation	Lab 2 **Quiz 1 (Chapter 1-2)**
Five 06/10/2014 – 10/10/2014	**Chapter 3: Chemical Reaction**	**Chapter 3: Chemical Reaction** (f) Amount of reactants and products (g) Limiting reagents and reaction yield (h) Reaction in aqueous solution, concentration of solution (i) Gravimetric analysis, acid-base titrations	Tutorial 2 *Hari Raya Aidil Adha* *Birthday of TYT Malacca*
Six 13/10/2014 – 17/10/2014	**Chapter 4: Structure of Atoms and Periodic Table**	**Chapter 4: Structure of Atoms and Periodic Table** (a) Model of the atom, quantum numbers (b) Atomic orbital, electron configuration and building up principle (Aufbau's, Hund's, Pauli's)	Lab 3
Seven 20/10/2014 – 24/10/2014		**SEMESTER BREAK**	*Deepavali* *Awal Muharram*
Eight 27/10/2014 – 31/11/2014	**Chapter 4: Structure of Atoms and Periodic Table**	**Chapter 4: Structure of Atoms and Periodic Table** (c) Periodic table (d) Periodic classification of the elements (e) Electron configurations of ions and transition metal	Tutorial 3
Nine 03/11/2014 – 07/11/2014	**Chapter 4: Structure of Atoms and Periodic Table**	**Chapter 4: Structure of Atoms and Periodic Table** (f) Trends in physical and chemical properties such as atomic radii, ionization energies, electron affinities and electronegativities	Lab 4
Ten 10/11/2014 – 14/11/2014	**Chapter 5: Chemical Bonding**	**Chapter 5: Chemical Bonding** (a) Ionic bonding, covalent bonding (b) Electronegativity and polarity, molecular geometry (c) Intermolecular forces and effect of polarisation	Tutorial 4 **Test (Chapter 1- 4)**

Eleven 17/11/2014 – 21/11/2014	**Chapter 6: Properties of Matter**	**Chapter 6: Properties of Matter** (a) Three states of matter, phase changes (b) The gas laws (Boyle's, Charles' & Guy Lussac's, Avogadro's, Ideal gas equation) (c) Gas stoichiometry	Lab 5
Twelve 24/11/2014 – 28/11/2014	**Chapter 6: Properties of Matter**	**Chapter 6: Properties of Matter** (d) Liquids properties (Surface tension, cohesion, adhesion, viscosity) (e) Solids (Crystalline and amorphous solid), unit cell (cubic cells) (f) Characterization of materials	Tutorial 5 **Quiz 2 (Chapter 5)**
Thirteen 01/12/2014 - 05/12/2014		**PRESENTATION WEEK**	Tutorial 6
Fourteen 08/12/2014 - 12/12/2014	**Chapter 7: Thermochemistry**	**Chapter 7: Thermochemistry** (a) Energy in chemical reaction, system and surrounding (b) Exothermic and endothermic process, enthalpy (c) Thermochemistry equation	Tutorial 7
Fifteen 15/12/2014 - 19/12/2014	**Chapter 7: Thermochemistry**	**Chapter 7: Thermochemistry** (d) Calorimetric, heat capacity , specific heat capacity (e) Standard enthalpy of formation, standard enthalpy of reaction (f) Hess Law	Revision
Sixteen 22/12/2014 - 26/12/2014		**STUDY WEEK**	*Krismas Day*
Seventeen 29/12/2014 - 13/01/2015		**EXAMINATION WEEK**	

8.0 COURSE STAFFS

a. Lecture Sessions & Laboratory Sessions

GROUP	1DMC
	Mr. Imran Syakir Bin Mohamad Room: 8/5/9, Fifth Floor, Academic Building, Industrial Campus, UTeM ☎: 06-234-6761, : 019-5075710 : imran@utem.edu.my http://imsymo.blogspot.com/p/kimia.html

b. Technician/Laboratory Staff

GROUP	1 DMC
	Mr. Ismail Bin Ibrahim Room: Chemistry Lab, Industrial Campus, UTeM ☎: 06-234-6870 : ismailb@utem.edu.my