CHRISTMAS TERM PLAN

CHEMISTRY

GRADE 12

SEPTEMBER 4 – DECEMBER 19, 2023

Subject to Change

DATE	WEEK #	THEORY	ASSIGNMENT/ COURSEWORK /LABS
SEPTEMBER			
September 11-15	**WEEK 1**	**MOLE CONCEPT** **Link to objective 3, module 1, unit 1 cape chemistry syllabus** ● apply Avogadro's law, ● define moles, molar mass ● write molecular and ionic equations ● mole concepts calculation, ● empirical and molecular formula, (from combustion data, absolute masses or relative abundance of elements), ● Titrimetric analysis (acid base and redox) **REDOX** **Link to objective 4, module 1, unit 1 cape chemistry syllabus** ● Explain redox reactions in terms of electron transfer and changes in oxidation (Construct relevant half equations for redox reactions;) ● Deduce balanced equations for redox reactions from relevant half equations; ● Perform simple displacement reactions to order elements in terms of oxidising or reducing ability.	
September 18-22	**WEEK 2**	**KINETIC THEORY**	**LAB #4 - Titration**

		Link to objective 5, module 1, unit 1 cape chemistry syllabus ● Assumptions of the kinetic theory with respect to an ideal gas. ● Explain the differences between real and ideal gases. ● Perform calculations using Boyle's law, Charles' law and the ideal gas equation. ● Explain the liquid state, melting and vaporization **ENERGETICS** **Continued Link to objective 6, module 1, unit 1 cape chemistry syllabus** ● Apply concepts associated with enthalpy changes ● Explain the effect of ionic charge and radius on the magnitude of lattice energy ● State Hess' law of constant heat summation (under standard conditions) Calculate enthalpy changes from appropriate experimental data	
September 25-29	**WEEK 3**	**ENERGETICS** **Continued Link to objective 6, module 1, unit 1 cape chemistry syllabus** ● Apply concepts associated with enthalpy changes ● Explain the effect of ionic charge and radius on the magnitude of lattice energy ● State Hess' law of constant heat summation (under standard conditions) ● Calculate enthalpy changes from appropriate experimental data.	**LAB # 3 – Dilution Titration** **LAB – Fuels PD**
OCTOBER			
October 2-6	**WEEK 4**	**RATES OF REACTIONS**	**LAB # 5 - Redox Titration**

		Link to objective 1, module 2, unit 1 cape chemistry syllabus • Explain the concepts associated with reaction rates. • Carry out experiments studying the factors which affect rate. • Construct rate equations for zero, first and second order reactions. • Deduce the order of reaction from experimental data. • Interpret concentration vs time, concentration vs rate for zero and first order reactions.	**Coursework –** Moles, Kinetic Theory & Energetics
October 9-11	**WEEK 5**	**RATES OF REACTIONS** **Continued link to objective 1, module 2, unit 1 cape chemistry syllabus** • Perform calculations from rate data • Perform calculation using half-life data. • Explain the effect of temperature and catalysts on the rate of the reaction using Boltzman distribution of energies (and of collision frequency)	**LAB # 6&7 – Redox Labs**
MID-TERM BREAK **October 12-16**			
October 17-20	**WEEK 6**	**RATES OF REACTION CONT'D** • Perform calculation using half-life data. • Explain the effect of temperature and catalysts on the rate of the reaction using Boltzman distribution of energies (and of collision frequency)	**LAB # 9 – Rate of Reaction**
1st STANDARDISED TEST **OCTOBER 23-27** **WEEK 7**			
October 23-27	**WEEK 7**	**RATES OF REACTION CONT'D** • Perform calculation using half-life data. • Explain the effect of temperature and catalysts on the rate of the reaction using Boltzman	

		distribution of energies (and of collision frequency).	
NOVEMBER			
October 30 - November 3	**WEEK 8**	**CHEMICAL EQUILIBRA** **Link to objective 2, module 2, unit 1 cape chemistry syllabus** ● Dynamic Equilibrium ● Kc and Kp- definitions and calculations involving ● Le Chatelier's principle (state and apply it to explanations) ● Interpret how changes (concentration, pressure, temperature and presence of catalyst) affect equilibrium constant	**LAB # 14 - Energetics**
November 6-10	**WEEK 9**	**CHEMICAL EQUILIBRIA** ● Le Chatelier's principle (state and apply it to explanations) ● Interpret how changes (concentration, pressure, temperature and presence of catalyst) affect equilibrium constant. **ACID-BASE EQUILIBRIUM** **Link to objective 3, module 2, unit 1 cape chemistry syllabus** ● Explain the differences in behaviour of strong and weak acids and bases, using Bronsted-Lowry theory	**LAB # 15 - Energetics**
November 13-17	**WEEK 10**	**ACID-BASE EQULIBRIUM** ● Define the terms Ka, pH, pKa, and pKb, Kw and pKw; ● Perform calculations involving pH, pOH, Ka, pKa Kw and pKw, Kb and pKb; ● Perform calculations involving pH, pOH, Ka, pKa Kw and pKw, Kb and pKb; ●	**COURSEWORK** – to be decided
November 20-24	**WEEK 11**	**ACID-BASE EQUILIBRIUM CONT'D** ● Describe the changes in pH during acid/base titrations; ● Explain what is meant by the pH range of indicator; and,	

		• State the basis for the selection of acid/base indicator for use in titrations.	
November 27-December 1	**WEEK 12**	**BUFFERS AND pH** **Link to objective 4, module 2, unit 1 cape chemistry syllabus** • Define the term 'buffer solution'; • Explain how buffer solutions control pH • Calculate the pH of buffer solutions from appropriate data; • Calculate the pH of buffer solutions from appropriate data; and, • Discuss the importance of buffers in biological systems and in industrial processes.	**LAB # 12 – Acid, Base, Indicators and pH**
DECEMBER			
2nd STANDARDISED TEST DECEMBER 4-8 WEEK 13			
December 4-8	**WEEK 13**	**BUFFERS AND pH CONTD** • Calculate the pH of buffer solutions from appropriate data; • Calculate the pH of buffer solutions from appropriate data; and, • Discuss the importance of buffers in biological systems and in industrial processes.	
December 11-15	**WEEK 14**	**SOLUBILITY PRODUCT** **Link to objective 5, module 2, unit 1 cape chemistry syllabus** • Define the term solubility product, Ksp • Explain the principles underlying solubility product and the common ion effect; • Perform calculations involving solubility product;	**ALL** lab sheets due

		• Relate the solubility product principle to the selective precipitation of substances.	
END OF TERM DECEMBER 19, 2023			