Tripoli Evangelical School
Grade 11 Scientific
Chemistry curriculum

I- Thermochemistry
- Define the thermal effect of chemical reactions.
- Measurement of the heat of reaction.
- Heat of formation of compounds and ions.
- Numerical application of Hess' Law.

II- Electrochemistry
A- Electrochemical Cells
- Define the different terms used in oxidation-reduction.
- Establish a qualitative electrochemical classification.
- Conditions needed for redox reaction to occur. Electrochemical Series, electromotive force.
- Constructing an electrochemical cell.
- Balancing and completing a redox reaction in acidic or basic solution.
- Stoichiometric calculation involving redox reactions, titration involving redox reactions.

B- Electrolysis
- Redox reactions that occur at the electrodes during electrolysis.
- Rules to write electrodes half reactions during electrolysis.
- Numerical calculations.
- Electroplating and electro-refining.

III- Organic Chemistry (I)
A- Elementary Organic Analysis
- Quantitative analysis of organic compounds
- Law of definite proportions.
- Molecular formulas.
- Identification of major organic functions.

B- Aliphatic Hydrocarbons
- Alkanes and alkenes.
- Naming rules, developed and condensed structural formulas.
- Isomerism: chain isomers, geometric isomers, function and optical isomers.
- Chemical properties of aliphatic hydrocarbons (addition reactions).
- Problem solving

C- Benzene: Structure of benzene, delocalization of π bonds in phenyl ring.

VI- Organic Chemistry (II)
D- Alcohols
- Naming rules. Isomerism. Classes of alcohols.
- Common chemical properties.
- Distinctive chemical properties: Oxidation, dehydrogenation reactions.
- Comparative studies based upon distinctive chemical properties.

E- Aldehydes and Ketones

- Naming rules. Isomerism.
- Identification tests for carbonyl compounds.
- Identification tests for aldehydes: Fehling solution, Tollen's reagent and Schiff's reagent.
- Combined problems related to applications in chapters of Alcohols, aldehydes and Ketones.

F- Carboxylic Acids

- Naming rules. Isomerism with esters.
- Carboxylic acids as weak, partial dissociation in water.
- Chemical acidic properties.
- Chemical organic properties.
- Acid derivatives: Anhydrides, Mixed anhydrides, Alkanoyl chlorides and Amides.
- Comparative study related to the properties of acids and acid derivatives.
- Esterification reactions using acid derivatives. Advantages.

G- Amines

- Naming rules. Classes of amines and Isomerism.
- Amines as weak bases, partial dissociation in water.
- Reactions with carboxylic acids.
- Reactions with acid derivatives.

H- Amino Acids*

- Functional groups and naming rules of alpha amino acids.
- Enantiomers and Cram representation.
- Condensation of alpha amino acids to form peptides.
- Hydrolysis of peptides to regenerate amino acids.

I- Soaps and Detergents*

- Fatty acids, Glycerol and Triglycerides.
- Saponification reaction.
- Hydrolysis of triglycerides to form fatty acids.
- Properties of soaps related to the structure of anion, and principle of detergency.

J- Medicinal Drugs*

- Study of the hemi-synthesis of Aspirin and Panadol.
- Direct application related to esterification reactions using acid anhydrides.
- Problem solving.