CURRICULUM CONTENT

1. Equilibria

- Chemical equilibria: reversible reactions; dynamic equilibrium
- Factors affecting chemical equilibria
- Equilibrium constants
- The Haber process; the Contact process

2. Redox reactions

- Describe and explain redox processes in terms of electron transfer and/or of changes in oxidation number (oxidation state)
- Calculation of oxidation number

3. Group 7, the halogens

- The similarities and trends in the physical and chemical properties of chlorine, bromine and iodine.
- Characteristic physical properties
- The relative reactivity of the elements as oxidising agents
- Some reactions of the halide ions
- The manufacture of chlorine
- The reactions of chlorine with aqueous sodium hydroxide
- The important uses of the halogens and of halogen compounds

4. Group 2, the alkaline earth metals

- Similarities and trends in the properties of the Group II metals magnesium to barium and their compounds
- Some uses of Group II compounds

5. The extraction of metals

- Describe the ease in obtaining metals from their ores by relating the elements to the reactivity series
- Describe the essential reactions in the extraction of iron from hematite
- Describe the conversion of iron into steel using basic oxides and oxygen

6. Haloalkanes

- Halogenoalkanes
- Nucleophilic substitution
- Hydrolysis
- Formation of nitriles , primary amines
- Elimination
- Relative strength of the C-Hal bond

7. Alkenes

- Alkenes (exemplified by ethene)
- Addition and oxidation reactions
- Industrial importance

8. Alcohols

- Alcohols (exemplified by ethanol)
- Reactions of alcohols:
  - combustion
  -substitution to give halogenoalkanes
  -reaction with sodium
  -oxidation to carbonyl compounds and carboxylic acids
  -dehydration to alkenes
  -Ester formation
- Classify hydroxy compounds into primary, secondary and tertiary alcohols
- Suggest characteristic distinguishing reactions, e.g. mild oxidation

9. Analytical techniques

- Describe some analytical techniques:
  -the infra-red spectroscopy
  -the infra-red spectrometer