

Wah Yan College Kowloon
Scheme of Work (2017-2018)

Textbook	1. New 21st Century Chemistry 6 Topic 14 Industrial Chemistry (Elective Part) (1st Edition) (WY) 2. New 21st Century Chemistry 8 Topic 16 Analytical Chemistry (Elective Part) (1st Edition) (WY)
Other Resources	

◆ **Repertoire of Self-directed Learning Skills:** reading to learn, notes-taking, looking up words in the dictionary, pre-lesson preparation, group discussion, group presentation, initiative to ask questions, setting learning objectives and doing reflection, eLearning platform with instant feedback, flipped classroom, peer assessment, searching for information on the internet, project learning, training of higher-order thinking skills

School Term	Weeks/ Dates	Topics/ Extended Parts*	Learning Objectives/ Teaching Focus	Teaching and Learning Activities	Self-directed Learning Skills*	Values#/ Basic Law Education	Consolidation and Assessment
First Term		Topic 14 Industrial Chemistry					
		Unit 45 An introduction to industrial chemistry					
	1	45.1 What is chemical industry?	<ul style="list-style-type: none"> Chemical industry converts raw materials into products of greater value to us 	<ul style="list-style-type: none"> PowerPoint Discussion 	Setting learning objectives and doing reflection	I,II	
	1	45.2 Products from the chemical industry	<ul style="list-style-type: none"> Five categories of products from the chemical industry 	<ul style="list-style-type: none"> PowerPoint Discussion 		I,II,III	
	1	45.3 The operation of a chemical process in industry*	<ul style="list-style-type: none"> Feedstocks Batch and continuous operations 	<ul style="list-style-type: none"> PowerPoint 		I,II	
1	45.4 Petrochemical	<ul style="list-style-type: none"> China's petrochemical 	<ul style="list-style-type: none"> PowerPoint 		II		

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		industry	industry • Sustainable development	• Discussion			
	1	45.5 Production of vitamin C*	• Comparing two processes of producing vitamin C	• PowerPoint		II	
	2	45.6 The use of catalysts	• Why bother with reaction kinetics?	• PowerPoint • Discussion		II	
	2	45.7 The effect of change in concentration on the rate of a reaction	• Rate equation • Rate constant	• PowerPoint		II,IV	
	2	45.8 Order of reaction	• Overall order of reaction • Zero, first and second order reactions • Rate-concentration graphs • Concentration-time graphs	• PowerPoint		I,II	
	2	45.9 Units of rate constant k for reactions of different order	• Units of rate constant k for zero, first and second order reactions	• PowerPoint		I,II	• Checkpoint
	2	45.10 Experimental	• Determining initial	• PowerPoint		I,II	

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		determination of the rate equation for a reaction — the method of initial rate	<p>rates from different concentration-time curves</p> <ul style="list-style-type: none"> Using the reciprocal of the time required to produce a small amount of a product as a measure of the initial rate 	<ul style="list-style-type: none"> Activity 45.1 — Determining the rate equation for the reaction between sodium thiosulphate solution and dilute sulphuric acid using a microscale chemistry experiment 			
	3	45.11 Using the iodine clock method to determine the rate equation for a reaction	Using the iodine clock method to determine the rate equation for the reaction between peroxodisulphate ion and iodide ion	<ul style="list-style-type: none"> PowerPoint Activity 45.2 — Determining the rate equation for the reaction between acidified propanone solution and iodine by colorimetry Activity 45.3 — Determining the rate equation for an iodine clock reaction 		I,II	<ul style="list-style-type: none"> Checkpoint Unit exercise
		Unit 46 Factors affecting the rate of a reaction					
	3	46.1 The effect of change	<ul style="list-style-type: none"> Illustrating the effect 	<ul style="list-style-type: none"> PowerPoint 	Setting	IV	

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		in temperature on the rate of a reaction	of temperature change on the rate of reaction using the reaction between dilute sulphuric acid and sodium thiosulphate solution		learning objectives and doing reflection		
	3	46.2 A further look at the collision theory	<ul style="list-style-type: none"> • Basic ideas of the collision theory • Energy profiles • Activation energy 	• PowerPoint		I,II	• Checkpoint
	3	46.3 The energy distribution curve	<ul style="list-style-type: none"> • Maxwell-Boltzmann distribution curve for the distribution of molecular kinetic energy for a gas • Effect of increasing temperature on the energy distribution curve • Explaining the effect of temperature on the rate of reaction 	• PowerPoint		I,II	• Checkpoint
	4	46.4 Rate equation and	• Energy profile for a	• PowerPoint	Training of	I	• Checkpoint

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		reaction mechanism*	<p>reaction which takes place in more than one step</p> <ul style="list-style-type: none"> • Linking the rate equation to the reaction mechanism 		higher-order thinking skills		
	4	46.5 The Arrhenius equation	<ul style="list-style-type: none"> • Determining the activation energy for a reaction by using the Arrhenius equation 	<ul style="list-style-type: none"> • PowerPoint • Activity 46.1 — Determining the activation energy for a reaction 		I,II	• Checkpoint
	4	46.6 Catalysts	<ul style="list-style-type: none"> • Positive and negative catalysts • Features of catalysts 	<ul style="list-style-type: none"> • PowerPoint 		I	
	4	46.7 How does a catalyst work	<ul style="list-style-type: none"> • Energy profiles for an uncatalyzed reaction and catalyzed reactions • Homogeneous catalyst and heterogeneous catalyst 	<ul style="list-style-type: none"> • PowerPoint • Activity 46.2 — Catalyzing the reaction between peroxodisulphate ion and iodide ion 		III,V	• Checkpoint
	5	46.8 Heterogeneous catalysis*	<ul style="list-style-type: none"> • Illustrating how a heterogeneous catalyst 	<ul style="list-style-type: none"> • PowerPoint 			

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			works by using a model for the reaction pathway for the formation of ammonia from nitrogen and hydrogen <ul style="list-style-type: none"> • Catalysts in catalytic converters • Catalyst poisoning 				
	5	46.9 Homogeneous catalysis*	<ul style="list-style-type: none"> • Illustrating how a homogeneous catalyst works by using the oxidation of iodide ion by peroxodisulphate ion 	<ul style="list-style-type: none"> • PowerPoint 		II,IV	
	5	46.10 Enzyme catalysis	<ul style="list-style-type: none"> • Making ethanol by fermentation • Why are enzymes so popular in chemical industry? 	<ul style="list-style-type: none"> • PowerPoint 		II,IV	<ul style="list-style-type: none"> • Checkpoint • Unit exercise
		Unit 47 Industrial processes					
	5	47.1 Building a chemical plant in a city	<ul style="list-style-type: none"> • Using a scenario of building a chemical 	<ul style="list-style-type: none"> • PowerPoint 	Setting learning	II	

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			manufacturing plant as an introduction to three industrial processes: <ul style="list-style-type: none"> – manufacture of nitrogenous fertilizers – manufacture of chlorine gas – manufacture of methanol 		objectives and doing reflection		
	5	47.2 What do plants need to grow properly?	<ul style="list-style-type: none"> • The nitrogen cycle • Three main nitrogen fixation processes 	<ul style="list-style-type: none"> • PowerPoint • Animations 		I,II	
	6	47.3 Nitrogenous fertilizers	<ul style="list-style-type: none"> • Straight N fertilizers and NPK compound fertilizers 	<ul style="list-style-type: none"> • PowerPoint 		I,III	
	6	47.4 Ammonia — the key to nitrogenous fertilizers	<ul style="list-style-type: none"> • Feedstocks • Reaction conditions • Flow diagram for the Haber process 	<ul style="list-style-type: none"> • PowerPoint 		II,IV	
	6	47.5 Obtaining an economic yield in the Haber process	<ul style="list-style-type: none"> • Temperature • Pressure • Reaction conditions most manufacturers 	<ul style="list-style-type: none"> • PowerPoint • Animations 		I,III	

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			use				
	6	47.6 From ammonia to nitrogenous fertilizers	<ul style="list-style-type: none"> Main stages in the manufacture of nitric acid from ammonia 	<ul style="list-style-type: none"> PowerPoint Discussion 		IV,V	
	6	47.7 Working on large scale production of nitrogenous fertilizers*	<ul style="list-style-type: none"> Storage of raw materials Transport of materials Transfer of heat Separation Process control 	<ul style="list-style-type: none"> PowerPoint 	Training of higher-order thinking skills	IV,V	
	6	47.8 NPK compound fertilizers	<ul style="list-style-type: none"> Flow plan for the manufacture of NPK compound fertilizers 	<ul style="list-style-type: none"> PowerPoint 		I,II	
	6	47.9 The pros and cons of fertilizers	<ul style="list-style-type: none"> Agriculture — the key to poverty reduction Environmental problems associated with the use of fertilizers 	<ul style="list-style-type: none"> PowerPoint Animations 		I,II	
	7	47.10 The chloro-alkali industry	<ul style="list-style-type: none"> Common uses of hydrogen, chlorine and sodium hydroxide 	<ul style="list-style-type: none"> PowerPoint 		I,II	
	7	47.11 Manufacture of chlorine	<ul style="list-style-type: none"> Mercury electrolytic cell 	<ul style="list-style-type: none"> PowerPoint Animations 		I	

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			<ul style="list-style-type: none"> • Diaphragm cell • Membrane cell 	<ul style="list-style-type: none"> • Discussion 			
	7	47.12 Uses of methanol	<ul style="list-style-type: none"> • Chemicals produced from methanol 	<ul style="list-style-type: none"> • PowerPoint 		II	
	7	47.13 From natural gas to methanol	<ul style="list-style-type: none"> • Main stages in the manufacture of methanol from natural gas <ul style="list-style-type: none"> – syngas generation – methanol synthesis – crude methanol purification • Changes in the production process of methanol 	<ul style="list-style-type: none"> • PowerPoint • Discussion 		I,II,III	
	7	47.14 Methanol — a green feedstock?	<ul style="list-style-type: none"> • Methanol from biomass • Methanol from carbon dioxide captured from flue gas 	<ul style="list-style-type: none"> • PowerPoint 		I,II,III	
	7	47.15 Choosing a site for a chemical plant*	<ul style="list-style-type: none"> • Factors to consider when choosing a site for a chemical plant 	<ul style="list-style-type: none"> • PowerPoint • Discussion 	Training of higher-order thinking skills	I,II	• Unit exercise
		Unit 48 Green chemistry					

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	7	48.1 Sustainable development and green chemistry	<ul style="list-style-type: none"> • Meaning of sustainable development • 12 principles of green chemistry 	• PowerPoint	Setting learning objectives and doing reflection	I,III	
	8	48.2 Feedstocks from renewable resources	<ul style="list-style-type: none"> • Illustrating the use of feedstocks renewable resources by using an example of producing a polymer from corn 	• PowerPoint		I,IV	
	8	48.3 Atom economy	<ul style="list-style-type: none"> • What atom economy is • Calculations involving percentage atom economy • A greener pain reliever — ibuprofen 	• PowerPoint		I,III	• Checkpoint
	8	48.4 Energy efficiency	<ul style="list-style-type: none"> • Methods for making industrial processes more energy efficient 	• PowerPoint		I,III,V	
	8	48.5 Manufacture of acetic acid in industry	<ul style="list-style-type: none"> • Oxidation of naphtha or butane • The Monsanto process • The Cativa process 	<ul style="list-style-type: none"> • PowerPoint • Discussion 		I,III,V	
	8	48.6 Green chemistry and	<ul style="list-style-type: none"> • Stages of the life cycle 	• PowerPoint		I,III,V	• Unit exercise

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		the life cycle of a product	of a product • How green chemistry can facilitate environmental improvements in the life cycle of a product	• Discussion			
	9	First Term Assessment					
		Topic 16 Analytical Chemistry					
		Unit 54 Tests for functional groups; separation and purification of compounds					
	10	54.1 Chemical tests for various functional groups in carbon compounds	• Functional groups of different homologous series	• PowerPoint	Setting learning objectives and doing reflection	II	
	10	54.2 Tests for the alkene functional group	• Bromine test • Treatment with acidified aqueous solution of potassium permanganate	• PowerPoint		I,III	
	10	54.3 Tests for the alcohol	• Oxidation by acidified	• PowerPoint		II,IV	• Checkpoint

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		functional group	aqueous solution of potassium dichromate <ul style="list-style-type: none"> • Iodoform test • Lucas reagent 				
	10	54.4 Tests for the aldehyde and ketone functional groups	<ul style="list-style-type: none"> • Treatment with 2,4-dinitrophenylhydrazine • Treatment with Tollens' reagent (silver mirror test) • Triiodomethane formation (Iodoform test) 	<ul style="list-style-type: none"> • PowerPoint • Studying the reactions of an aldehyde and a ketone with some reagents 		I,III	• Checkpoint
	10	54.5 Tests for the carboxylic acid functional group	<ul style="list-style-type: none"> • Treatment with aqueous solution of sodium hydrogencarbonate • Ester formation 	<ul style="list-style-type: none"> • PowerPoint 		I,III	• Checkpoint
	11	54.6 Identifying functional group(s) in an unknown sample in the laboratory	<ul style="list-style-type: none"> • Deducing the functional group(s) in a sample based on the observations of tests on the sample 	<ul style="list-style-type: none"> • PowerPoint • Activity 54.2 — Identifying the functional groups in two unknown compounds 		I,III	
	11	54.7 Separation and	<ul style="list-style-type: none"> • Common separation 	<ul style="list-style-type: none"> • PowerPoint 		I,II	

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		purification of compounds	and purification methods for a liquid product • Common separation and purification methods for a solid product				
	11	54.8 Distillation	• Set-up for distillation • Water condenser • Air condenser	• PowerPoint		I,II	
	11	54.9 Fractional distillation	• For separating a mixture of miscible liquids • Set-up for fractional distillation	• PowerPoint		I,II,III	
	11	54.10 Liquid-liquid extraction	• Techniques for working with a separating funnel	• PowerPoint		I,II,III	
	11	54.11 Re-crystallization	• Choosing a suitable solvent • Dissolving the crude solid product in the chosen solvent	• PowerPoint		I,II,III	• Checkpoint

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			<ul style="list-style-type: none"> Allowing crystals to form and collecting crystals by filtration under reduced pressure 				
	11	54.12 Chromatography	<ul style="list-style-type: none"> What a stationary phase is What a mobile phase is 	<ul style="list-style-type: none"> PowerPoint 		I,II,III	
	11	54.13 Paper chromatography	<ul style="list-style-type: none"> Working principle of paper chromatography Identifying colourless components The retention ratio R_f 	<ul style="list-style-type: none"> PowerPoint Activity 54.3 — Using paper chromatography for the separation and identification of amino acids 		I,II,III	<ul style="list-style-type: none"> Checkpoint
	11	54.14 Column chromatography	<ul style="list-style-type: none"> Working principle of column chromatography 	<ul style="list-style-type: none"> PowerPoint 		I,II,III	
	11	54.15 Thin layer chromatography	<ul style="list-style-type: none"> Working principle of thin layer chromatography 	<ul style="list-style-type: none"> PowerPoint 		III	
	11	54.16 Tests for purity of a product	<ul style="list-style-type: none"> Determining the melting point of a solid product Determining the 	<ul style="list-style-type: none"> PowerPoint 		I,II	<ul style="list-style-type: none"> Checkpoint Unit exercise

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			boiling point of a liquid product				
		Unit 55 Quantitative methods of analysis					
	12	55.1 Quantitative analysis*	<ul style="list-style-type: none"> Gravimetric analysis Volumetric analysis Choosing an analytical method 	<ul style="list-style-type: none"> PowerPoint 	Setting learning objectives and doing reflection	II,III	
	12	55.2 Steps of the precipitation method in gravimetric analysis*	<ul style="list-style-type: none"> Filtering off the precipitate Drying the precipitate Calculating the percentage by mass of the species being analyzed in sample 	<ul style="list-style-type: none"> PowerPoint 	Training of higher-order thinking skills	I,III,V	
	12	55.3 Possible major sources of error*	<ul style="list-style-type: none"> Systematic error Random error 	<ul style="list-style-type: none"> PowerPoint 		I,III,V	
	12	55.4 Gravimetric determination of phosphorus content in a sample of fertilizer*	<ul style="list-style-type: none"> Procedure for preparing a phosphate precipitate using a known mass of fertilizer Calculating the 	<ul style="list-style-type: none"> PowerPoint Discussion Activity 55.1 — Determining the phosphorus content in a sample of fertilizer 		I,III,V	

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			percentage by mass of phosphorus in the sample of fertilizer • Sources of error				
	12	55.5 Gravimetric determination of calcium content in a sample solution*	<ul style="list-style-type: none"> • Procedure for preparing a calcium precipitate using a known volume of sample solution • Calculating the percentage by mass of calcium ions in the sample 	<ul style="list-style-type: none"> • PowerPoint • Discussion • Activity 55.2 — Determining the calcium content in a sample solution 		I,II	• Checkpoint
	12	55.6 Precipitation titrations in volumetric analysis	<ul style="list-style-type: none"> • Procedure for determining the concentration of chloride ions in sea water by precipitation titration • Calculating the concentration of chloride ions in a sample of sea water 	<ul style="list-style-type: none"> • PowerPoint • Discussion • Activity 55.3 — Determining the concentration of chloride ions in a sea water sample by titration with a standard aqueous solution of silver nitrate 		I,II	
	12	55.7 Redox titrations in	• What redox titration is	• PowerPoint		I,II,V	

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		volumetric analysis					
	12	55.8 Redox titrations involving an aqueous solution of potassium permanganate	<ul style="list-style-type: none"> Standardization of aqueous solution of potassium permanganate 	<ul style="list-style-type: none"> PowerPoint 		I,II	
	12	55.9 Determining the iron content in commercial iron tablets	<ul style="list-style-type: none"> Procedure for determining the iron content in commercial iron tablets by titration with standard aqueous solution of potassium permanganate 	<ul style="list-style-type: none"> PowerPoint Activity 55.4 — Determining the percentage by mass of iron(II) sulphate in a brand of iron tablets 		I,II,IV	
	12	55.10 Analyzing the quality of water by determining its permanganate index	<ul style="list-style-type: none"> What the permanganate index of water indicates Procedure for determining the permanganate index of a water sample Calculating the permanganate index of a water sample 	<ul style="list-style-type: none"> PowerPoint Activity 55.5 — Determining the permanganate index of a water sample 		II	<ul style="list-style-type: none"> Checkpoint

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	12	55.11 Determining the vitamin C content in a sample using a redox titration involving iodine	<ul style="list-style-type: none"> • Procedure for determining the vitamin C content in a sample by titration with aqueous iodine solution • Calculating the vitamin C content in the sample 	<ul style="list-style-type: none"> • PowerPoint 		III	
	12	55.12 Determining the concentration of sodium hypochlorite in a household bleach using an iodine / thiosulphate titration	<ul style="list-style-type: none"> • Procedure for determining the concentration of sodium hypochlorite in a bleach <ul style="list-style-type: none"> – reacting a known volume of sample with iodide ions to liberate iodine – titrating the iodine with a standard aqueous solution of sodium thiosulphate • Calculating the concentration of 	<ul style="list-style-type: none"> • PowerPoint • Activity 55.6 — Determining the sodium hypochlorite content in a bleach 		II,V	<ul style="list-style-type: none"> • Checkpoint • Unit exercise

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			sodium hypochlorite in the bleach				
		Unit 56 Instrumental analytical methods					
	12	56.1 The use of instruments in analytical chemistry	<ul style="list-style-type: none"> Some properties that are observed in the measurement process of analytical chemistry Advantages of instrumental analytical methods over the traditional gravimetric and volumetric analyses 	<ul style="list-style-type: none"> PowerPoint 	Setting learning objectives and doing reflection	I,III,V	
	13	56.2 Electromagnetic radiation	<ul style="list-style-type: none"> The electromagnetic spectrum Wavelength range of visible light 	<ul style="list-style-type: none"> PowerPoint 		I,II	
	13	56.3 The interaction of radiation with matter	<ul style="list-style-type: none"> Different kinds of behaviour that occur when a molecule absorbs energy 	<ul style="list-style-type: none"> PowerPoint 		I,II	
	13	56.4 Colorimetry	<ul style="list-style-type: none"> Components of a colorimeter 	<ul style="list-style-type: none"> PowerPoint 		II	<ul style="list-style-type: none"> Checkpoint

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			<ul style="list-style-type: none"> Determining the concentration of the species being analyzed in a sample from a calibration curve 				
	13	56.5 Infrared spectroscopy	<ul style="list-style-type: none"> For determining the functional groups present in carbon compounds 	<ul style="list-style-type: none"> PowerPoint 		II	
	13	56.6 Basic features of an infrared spectrum	<ul style="list-style-type: none"> Wavenumber recorded on an infrared spectrum Absorption bands 	<ul style="list-style-type: none"> PowerPoint 		I,II	
	13	56.7 Characteristic absorption wavenumber ranges for different bonds in carbon compounds	<ul style="list-style-type: none"> The wavenumber ranges at which some covalent bonds absorb infrared radiation 	<ul style="list-style-type: none"> PowerPoint Animations 		I,II	
	13	56.8 Using infrared spectrum in the identification of bonds (or functional groups) in carbon	<ul style="list-style-type: none"> Regions in the infrared spectrum where typical absorptions occur Characteristic infrared absorption 	<ul style="list-style-type: none"> PowerPoint 		I,III	

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		compounds	wavenumber ranges for some covalent bonds (stretching mode of vibration)				
	13	56.9 Interpreting infrared spectra	<ul style="list-style-type: none"> • Interpreting the infrared spectra of some carbon compounds <ul style="list-style-type: none"> – <i>cis</i>-but-2-ene – butan-1-ol – butanone – butanoic acid • – butan-1-amine 	• PowerPoint		I,II	• Checkpoint
	13	56.10 Mass spectrometry	<ul style="list-style-type: none"> • Basic components of a mass spectrometer • Uses of mass spectrometry 	• PowerPoint		I,II	
	13	56.11 Finding relative atomic masses and relative molecular masses from mass spectra	<ul style="list-style-type: none"> • How to find relative atomic masses and relative molecular masses from mass spectra Molecular ion peak	• PowerPoint		III	
	14	56.12 Using fragmentation	• Fragmentations that	• PowerPoint		IV	

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		patterns to determine the structures of molecules of carbon compounds	occur for the molecular ion of butane <ul style="list-style-type: none"> Identifying the ions corresponding to the major peaks in the mass spectrum of butane 				
	14	56.13 Fragmentation patterns of alkanes	<ul style="list-style-type: none"> Comparing the mass spectra of three alkanes with molecular formula C₅H₁₂ <ul style="list-style-type: none"> pentane 2-methylbutane 2,2-dimethylpropane 	<ul style="list-style-type: none"> PowerPoint 		I,II	
	14	56.14 Fragmentation patterns of aromatic compounds	<ul style="list-style-type: none"> Mass spectrum of methylbenzene Fragmentations that occur for the molecular ion of methylbenzene 	<ul style="list-style-type: none"> PowerPoint 		I,II	
	14	56.15 Fragmentation patterns of aldehydes and ketones	<ul style="list-style-type: none"> Mass spectrum of pentan-3-one Fragmentations that occur for the molecular ion of pentan-3-one 	<ul style="list-style-type: none"> PowerPoint 		I	

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			<ul style="list-style-type: none"> • Typical fragment ions produced in a mass spectrometer 				
	14	56.16 Differences in mass/charge ratio between peaks	<ul style="list-style-type: none"> • Some common differences in mass/charge ratio due to the loss of fragments 	<ul style="list-style-type: none"> • PowerPoint 		I,II	
	14	56.17 Interpreting mass spectra	<ul style="list-style-type: none"> • Mass spectrum of ethanol • Mass spectrum of benzoic acid 	<ul style="list-style-type: none"> • PowerPoint 	Training of higher-order thinking skills	I	<ul style="list-style-type: none"> • Checkpoint • Unit exercise
		Unit 57 Contribution of analytical chemistry to our society					
	15	57.1 Introduction	<ul style="list-style-type: none"> • Examples of use of analytical chemistry in different fields 	<ul style="list-style-type: none"> • PowerPoint 	Setting learning objectives and doing reflection	III,V	
	15	57.2 Food analysis	The important role of analytical chemistry in food analysis	<ul style="list-style-type: none"> • PowerPoint 		II,IV	
	15	57.3 Gas chromatography	<ul style="list-style-type: none"> • Basic components of a 	<ul style="list-style-type: none"> • PowerPoint 		II,IV	<ul style="list-style-type: none"> • Checkpoint

School Term	Weeks/ Dates	Topics/ Extended Parts*	Learning Objectives/ Teaching Focus	Teaching and Learning Activities	Self-directed Learning Skills*	Values [#] / Basic Law Education	Consolidation and Assessment
			gas-liquid chromatograph <ul style="list-style-type: none"> • Qualitative and quantitative analyses • Applications of gas chromatography 				
	15	57.4 Carbon monoxide in the air	<ul style="list-style-type: none"> • Expressing the concentration of a gas pollutant in the air in ppm • Carbon monoxide in the air of Hong Kong 	• PowerPoint		II,III	• Checkpoint
	15	57.5 Dioxins in the air	<ul style="list-style-type: none"> • What dioxins are • Determining the level of dioxins in the air 	• PowerPoint		II	
	15	57.6 Formaldehyde — a common indoor air pollutant	<ul style="list-style-type: none"> • Indoor sources of formaldehyde • Determining the level of formaldehyde in indoor air 	• PowerPoint		I,II	
	16	57.7 Forensic chemistry	<ul style="list-style-type: none"> • Examples of use of instrumental analytical methods in forensic chemistry 	• PowerPoint		I,III	

School Term	Weeks/ Dates	Topics/ Extended Parts*	Learning Objectives/ Teaching Focus	Teaching and Learning Activities	Self-directed Learning Skills*	Values [#] / Basic Law Education	Consolidation and Assessment
	16	57.8 Drink driving	<ul style="list-style-type: none"> Blood alcohol content Breath alcohol testing 	<ul style="list-style-type: none"> PowerPoint Activity 57.1 — Designing and making a portable alcohol breathalyzer 		II,IV	
	16	57.9 Fingerprint analysis	<ul style="list-style-type: none"> Three types of fingerprints existing at crime scenes Developing fingerprints — fuming with iodine 	<ul style="list-style-type: none"> PowerPoint 		II,IV	
	16	57.10 The role of analytical chemistry in clinical diagnoses	<ul style="list-style-type: none"> ◆ Example of use of analytical chemistry in clinical diagnoses 	<ul style="list-style-type: none"> PowerPoint 		IV,V	<ul style="list-style-type: none"> Unit exercise
	17-18	Christmas & New Year Holiday					
Second Term	19-21	Mock Examination					
	22-24	Revision week					
	24-25	Lunar New Year Holiday					
	26	Revision week					

* The extended parts should be marked with asterisks. These parts should be more challenging and can be covered when the students can master the knowledge, skills and values covered in the conventional topics.

Core Values of Wah Yan College, Kowloon

- I. Love and care
- II. Strive for excellence
- III. Respect and Justice
- IV. Responsibility
- V. Faith

Sustaining values

	Life	Family	Love	Justice	Truth
I. Love and care	1. Accept & feel positive about himself 2. Appreciation & Gratitude 3. Empathy & Compassion 4. Positive and grateful 5. Kind and humble	6. Love your family 7. Loyalty and fidelity 8. Family as a basic unit of society; marriage is the foundation of a family	9. Forgiveness & Reconciliation 10. Care for the poor and the needy 11. Service to others		
II. Strive for excellence	12. Reflective 13. Strive for excellence (Magis & fighting spirit), 14. Reflection (Examen), 15. Discern right from wrong (Ignatian Spirituality), 16. Men of Human Excellence (Competence, Commitment, Compassion, Conscience) 17. Perseverance				

	<p>18. Curiosity & willingness to learn</p> <p>19. Value imagination and creativity</p>				
III. Respect and Justice	<p>20. Life is valuable and respectable</p> <p>21. Manners and etiquette</p> <p>22. Openness to good in all things</p> <p>23. Honesty and integrity</p> <p>24. Faithfulness</p>	25. Mutual respect between a man and a woman	<p>26. Love your neighbours</p> <p>27. Respect for himself & others</p>	28. Respect the rights of others, equity, the common good, human dignity	
IV. Responsibility	<p>29. Freedom & Self-discipline</p> <p>30. Responsible with public property</p> <p>31. Responsibility</p>		32. Care for the environment	33. Social Identities: citizen identity, national identity and global citizen identity	
V. Faith					<p>34. Appreciate religious liturgies</p> <p>35. Explore & practise one's faith</p> <p>36. Sacrifice</p> <p>37. Experience of God</p> <p>38. The meaning of life</p> <p>39. Truth about God,</p> <p>40. Evangelization</p>

