

Year 12

Course Outline: Chemistry St Aidan's

Rationale: The first unit on the chemistry course is chemistry fundamentals (module 2), these are basic aspects of chemistry that build on knowledge from GCSE and underpin the concepts that will be studies throughout the rest of the course. Once the fundamentals are in place they are built upon by looking at the introduction of both inorganic chemistry/physical chemistry in module 3 and organic chemistry in module 4. Once these units have been completed then students have a good grounding in the three strands of chemistry and these are then built upon in module 5, further inorganic/physical chemistry and module 6 further organic chemistry. Module 3 and 4 rely on an understanding of the basic fundamentals of chemistry and these are revisited in all units throughout the course. Modules 5 and 6 cannot be accessed without the basic concepts covered in modules 3 and 4 and so are started at the end of year 12 and then continue into year 13. Module 1 is practical chemistry skills and this runs alongside the theory modules throughout the course with specific practical skills assessed for the practical endorsement at appropriate points.

		CONTENT	KE	//FUNDAMENTAL CONCEPTS		ASSESSMENT
	≻	Teacher 1	≻	Module 2		
	\succ	Module 2	\succ	2.2 Relative mass (2.1.1)	\succ	Chapter 3 and 4 test – 52 marks
	\succ	C2 Atoms, ions & compounds	\succ	2.3 Formulae and equations		of PEQ on 3.1 – 4.3 – completed
	\succ	C3 Amount of substance		(2.1.2)		in class under test conditions –
	\succ	C4 Acids & redox	\succ	3.1 Amount of substance and		links to all exams
				the mole <i>(2.1.3)</i>	≻	PAG 1 – calculating empirical
			\succ	3.2 Determination of formula		formula – practical activity,
				(2.1.1/2.1.3)		specific practical skills and
				o PAG 1		analysis skills assessed
			≻	3.3 Moles and volumes (2.1.3)	\succ	PAG 2 – Acid – Base titration –
			≻	3.4 Reacting quantities (2.1.3)		practical activity, specific
			\succ	4.1 Acids, bases and		practical skills and analysis skills
				neutralisation (2.1.4)		assessed
			≻	4.2 Acid – base titration		
				(2.1.4/2.1.3)		
				• PAG 2		
			≻	4.3 Redox <i>(2.1.5)</i>		
	≻	Teacher 2	≻	Module 2		
	≻	Module 2	≻	2.1 Atomic structure and	\succ	Module 2 test – 54 marks of PEQ
	≻	C2 Atoms, ions & compounds		isotopes (2.1.1)		covering chapters 2 – 6 –
Autumn	≻	C5 Electrons & bonding	≻	5.1 Electron structure (2.2.1)		completed in class under test
Term	≻	C6 Shapes of Molecules	≻	5.2 Ionic bonding and structure		conditions – links to all exams
				(2.2.2)	≻	Weekly PEQ worth 10 – 20
			>	5.3 Covalent bonding (2.2.2)		marks
			≻	6.1 Shapes of molecules and		
			~	ions (2.2.2)		
			~	6.2 Electronegativity and		
			~	polarity $(2.2.2)$		
			~	6.3 Intermolecular forces (2.2.2)		
			-	6.4 Hydrogen bonding (2.2.2)		
				Half-term	1	
	≻	Teacher 1	\succ	Module 3		
	≻	Module 3	\succ	7.1 The periodic table (3.1.1)	\succ	PAG 4 – identifying ions and
	\succ	C7 Periodicity	\succ	7.2 Ionisation energies (3.1.1)		writing a method – practical
	≻	C8 Reactivity trends	\succ	7.3 Periodic trends in bonding		activity, specific practical skills
	1			and structure (3.1.1)		and analysis skills assessed
	1		≻	8.1 Group 2 <i>(3.1.2)</i>	\succ	Weekly PEQ worth 10 – 20
	1		\succ	8.2 The halogens (3.1.3)		marks
	1		≻	8.3 Qualitative analysis (3.1.4)		
				o PAG 4		

	AA	Teacher 2 Module 4	AAA	Module 4 11.1 Organic chemistry (4.1.1)		 Chapter 11 test
	A A	C11 Basic concepts of organic C12 Alkanes		compounds (4.1.1)		
			۶	11.3 Representing the formula of organic compounds (4.1.1)		
				11.4 Isomerism (4.1.1)		
				mechanisms (4.1.1)		
			~	12.1 Properties of the alkanes (4.1.2)		
			۶	12.2 Chemical reaction of the alkanes (4.1.2)		
				Christmas Holiday		
	AA	Teacher 1 Module 3	AA	Module 3 9 1 Enthalpy changes (3 2 1)	Δ	Chanter 9 test - 52 marks of
	À	C9 Enthalpy	À	9.2 Measuring enthalpy changes (3.2.1/2.1.3) • PAG 3		PEQ on 9.1 – 9.4 – completed in class under test conditions – links to exam 1 and 3
			AA	9.3 Bond enthalpies <i>(3.2.1)</i> 9.4 Hess' law and enthalpy cycles <i>(3.2.1)</i>	•	PAG 3 – Enthalpy changes – practical activity, specific practical skills and analysis skills assessed
					>	Weekly PEQ worth 10 – 20 marks
	>	Teacher 2	۶	13.1 The properties of the	>	Chapter 13 test – PEQ on 13.1 –
		Module 4 C13 Alkenes	\triangleright	13.2 Stereoisomerism (4.1.3)		test conditions – links to exam 2
		C14 Alcohols	AA	13.3 Reaction of alkenes (4.1.3)13.4 Electrophilic addition in		and 3
				alkenes (4.1.3) 13.5 Polymerisation in alkenes		
			Δ	(4.1.3) 14.1 Proportios of alcohols		
Spring				(4.2.1)		
Term			>	14.2 Reaction of alcohols (4.2.1)		
	~	Teederal	N	Half-term	1	
	1 1	reacher 1 Module 3	A	10.1 Reaction rates (3.2.2/2.1.3) 10.2 Catalysts (3.2.2)		Module 3 test – 54 marks
	۶	C10 Reaction rates & equilibrium	۶	10.3 The Boltzmann distribution (3.2.2)		of PEQ covering chapters 7 – 10 – completed in class
		Cyamorian	۶	10.4 Dynamic equilibrium and le		under test conditions –
			۶	Chateller's principle (3.2.3) 10.5 The equilibrium constant Kc		links to exams 1 and 3
				– part 1 <i>(3.2.3)</i>		
		Teacher 2		Module 4		PAG 5 – Reflux and
	AA	Module 4 C15 Haloalkanes	۶	15.1 The chemistry of the haloalkanes (4.2.2)		oxidation of alcohols – practical activity using
	>	C16 Organic synthesis	۶	15.2 Organohalogen compounds		quick fit apparatus, specific practical skills and analysis
			۶	16.1 Practical techniques in		skills assessed
				• PAG 5		
			>	16.2 Synthetic routes <i>(4.2.3)</i>		
				Easter Holidav		

	\triangleright	Teacher 1				
	A	Revision for mock exam	A	Revision of modules 2 – 4 content and module 1 practical activities in preparations for the mock exam (see above for detailed content)	A	Mock Exam – PEQ worth 70 marks covering material from module 1 – 4 – in exam conditions in Constance Green
	AA	Module 5 C18 Rates of reaction	AA A A	Module 5 18.1 Orders, rate equations, and rate constants (5.1.1) 18.2 Concentration – time graphs (5.1.1) 18.3 Rate – concentration graphs and initial rates (5.1.1)		
		Teacher 2		Module 4		
		Module 4		17.1 Mass spectrometry (4.2.4)		
	-	cir specifoscopy		(4.2.4)		
Summer Term	٨	Revision for mock exam				
			L	Half-term	L	
	Мо	dule 5	Мо	dule 5		
	Теа	icher 1	۶	18.3 Rate – concentration	۶	PAG 9 – Rate of reaction –
	>	C18 Rates of reaction		graphs and initial rates (5.1.1) $\bigcirc PAG 9$		practical activity, specific
				• PAG 10		assessed
			\triangleright	18.4 Rate-determining step	\triangleright	PAG 10 – Rate of reactions,
			Δ	(5.1.1) 18 5 Pate constants and		including drawing computer
			-	temperature (5.1.1)		specific practical skills and
				,		analysis skills assessed
	N.4	dula C	N4 c			
		uule o Johar 2		25.1 Introducing henzene (6.1.1)		
		C25 Aromatic chemistry	2	25.2 Electrophilic substitution		
				reactions of benzene (6.1.1)		
				25.3 The chemistry of phenol		
				(0.1.1)		

Notes:

PEQ = Past Exam Questions

In the key/fundamental concepts column the number in the bracket *i.e.*(2.1.1) refer to the specification statements



STAIDAN'S & STJOHN FISHER, HARROGATE Course Outline: Chemistry Year 13 CONTENT KEY/FUNDAMENTAL CONCEPTS

	CONTENT	KEY/FUNDAMENTAL CONCEPTS	ASSESSIVIENT
	 Module 5 Teacher 1 ➤ C19 Equilibrium ➤ C20 Acids, bases & pH 	 Module 5 > 19.1 The equilibrium constant K_c – part 2 (5.1.2) > 19.2 The equilibrium constant K_p (5.1.2) > 19.3 Controlling the position of equilibrium (5.1.2) > 20.1 Brønsted – Lowry acids and bases (5.1.3) > 20.2 The pH scale and strong acids (5.1.3) > 20.3 The acid dissociation constant K_a (5.1.3) > 20.4 The pH of weak acids (5.1.3) > 20.5 pH and strong bases (5.1.3) 	 Chapter 18 test -PEQ on 18.1 – 18.5 – completed in class under test conditions – links to exam 1 and 3 Chapter 21 test -PEQ on 21.1 – 21.3 – completed in class under test conditions – links to exam 1 and 3
Autumn Term	 Module 6 Teacher 2 ➢ C25 Aromatic chemistry ➢ C26 Carbonyls & carboxylic acids 	 Module 6 25.4 Directing groups (6.1.1) 26.1 Carbonyl compounds (6.1.2) 26.2 Identifying aldehydes and ketones (6.1.2) 26.3 Carboxylic acids (6.1.3) 26.4 Carboxylic acid derivatives (6.1.3) PAG 7 	 PAG 7 – Formation of organic compounds – practical activity, specific practical skills and analysis skills assessed Chapter 25 test –PEQ on 25.1- 25.4 – completed in class under test conditions – links to exam 2 and 3
		Half-term	
	 Module 5 Teacher 1 C21 Buffers & neutralisation C22 Enthalpy & entropy 	 Module 5 21.1 Buffer solutions (5.1.3) 21.2 Buffer solutions in the body (5.1.3) 21.3 Neutralisation (5.1.3) PAG 11 22.1 Lattice Enthalpy (5.2.1) 22.2 Enthalpy changes in solution (5.2.1) 22.3 Factors affecting lattice enthalpy and hydration (5.2.1) 22.4 Entropy (5.2.2) 22.5 Free energy (5.2.2) 	 Module 4 test – 54 marks of PEQ covering chapters 11 – 17 – completed in class under test conditions – links to exams 2 and 3 PAG 11 – buffers or pH curves – practical activity, specific practical skills and analysis skills assessed Mock Exam – PEQ worth 100 marks covering material from module 1 – 5 – in exam conditions in Constance Green

	 Module 6 Teacher 2 ➢ C27 Amines, amino acids & proteins 	 27.1 Amines (6.2.1) 27.2 Amino acids, amides and chirality (6.2.2) 27.3 Condensation polymers (6.2.3) 	A	Chapter 27 test –PEQ on 27.1- 27.3 – completed in class under test conditions – links to exam 2 and 3
		Christmas Holiday	I	
Spring Term	 Module 5 Teacher 1 ▶ C23 Redox & electrode potentials ▶ C24 Transition elements C24 Transition elements 	 23.1 Redox reactions (5.2.3) 23.2 Manganate(VII) redox titrations (5.2.3) 23.3 Iodine/thiosulfate redox titrations Practical activities: redox titrations 23.4 Electrode potentials (5.2.3) PAG 8 23.5 Predictions from electrode potentials (5.2.3) 23.6 Storage and fuel cells (5.2.3) 24.1 d-block elements (5.3.1) 24.2 The formation and shapes of complex ions (5.3.1) 24.3 Stereoisomerism in complex ions (5.3.1) 24.4 Ligand substitution and precipitation (5.3.1) 24.5 Redox and qualitative analysis (5.3.1) 28.1 Carbon – carbon bond formation (6.2.4) 23.5 Piele (5.2.4) 		 PAG 8 – Electrochemical cells – practical activity, specific practical skills and analysis skills assessed Module 5 test – 54 marks of PEQ covering chapters 18 – 24 – completed in class under test conditions – links to exams 1 and 3 Chapter 28 test – PEQ on 28.1-28.3 – completed in class under test conditions – links to exam 2
	Module 5 Teacher 1 ➤ Revision	 28.2 Further practical techniques (6.2.5) PAG 6 28.3 Further synthetic routes (6.2.5) Half-term Final PAG PAG 12 – Research skills – research a reaction, write a method, write a risk assessment and then complete the practical 	~	PAG 12 – Research skills – practical activity, specific practical skills and analysis skills assessed
		complete the practical activity and process the results		

	Module 6 Teacher 2 ➤ C29 Chromatography & spectroscopy	 Module 6 29.1 Chromatography and functional group analysis (6.3.1) 29.2 Nuclear Magnetic Resonance (NMR) spectroscopy (6.3.2) 29.3 Carbon-13 NMR spectroscopy (6.3.2) 29.4 Proton NMR spectroscopy (6.3.2) 29.5 Interpreting NMR spectra (6.3.2) 29.6 Combined techniques (6.3.2) 	 Module 6 test – 54 marks of PEQ covering chapters 25 – 29 – completed in class under test conditions – links to exams 2 and 3 PAG 6 – Formation of organic compounds – practical activity, specific practical skills and analysis skills assessed
	Revision	Easter Holiday Revision for final exams	
			Mock exam papers – paper 1, 2 and 3 – full exam papers from previous years – sat in exam conditions in class
Summer		Half-term	
	<u>Exams</u>	<u>Exams</u>	<u>Exams</u>

ASSOCIATED SIXTH FORM

<u>Course Outline:</u> Chemistry St John Fisher Year 12

Rationale: The first unit on the chemistry course is chemistry fundamentals (module 2), these are basic aspects of chemistry that build on knowledge from GCSE and underpin the concepts that will be studies throughout the rest of the course. Once the fundamentals are in place they are built upon by looking at the introduction of both inorganic chemistry/physical chemistry in module 3 and organic chemistry in module 4. Once these units have been completed then students have a good grounding in the three strands of chemistry and these are then built upon in module 5, further inorganic/physical chemistry and module 6 further organic chemistry. Module 3 and 4 rely on an understanding of the basic fundamentals of chemistry and these are revisited in all units throughout the course. Modules 5 and 6 cannot be accessed without the basic concepts covered in modules 3 and 4 and so are started at the end of year 12 and then continue into year 13. Module 1 is practical chemistry skills and this runs alongside the theory modules throughout the course with specific practical skills assessed for the practical endorsement at appropriate points.

 Module 2 C2 Atoms, ions & compounds C3 Amount of substance C4 Acids & redox Module 2 2.1 Atomic structure and isotopes (2.1.1) 2.2 Relative mass (2.1.1) C4 Acids & redox C2 Acids & redox C4 Acids & redox<th></th><th>CONTENT</th><th>KEY/FUNDAMENTAL CONCEPTS</th><th>ASSESSMENT</th>		CONTENT	KEY/FUNDAMENTAL CONCEPTS	ASSESSMENT
 C2 Atoms, ions & compounds C3 Amount of substance C4 Acids & redox C4 Acid & redox <lic4 &="" acids="" li="" redox<=""> C4 Acid &</lic4>		Module 2	Module 2	
 C3 Amount of substance C4 Acids & redox 2.2 Relative mass (2.1.1) 2.3 Formulae and equations (2.1.2) 3.1 Amount of substance and the mole (2.1.3) 3.2 Determination of formula (2.1.1/2, 1.3) C3 Amount of substance and the mole (2.1.3) C4 Acids & redox <l< td=""><td></td><td>C2 Atoms, ions & compounds</td><td>2.1 Atomic structure and</td><td>Chapter 3 and 4 test – 52 marks</td></l<>		C2 Atoms, ions & compounds	2.1 Atomic structure and	Chapter 3 and 4 test – 52 marks
 C4 Acids & redox 2.2 Relative mass (2.1.1) 2.3 Formulae and equations (2.1.2) 3.1 Amount of substance and the mole (2.1.3) 3.2 Determination of formula (2.1.1/2, 1.3) Anount of substance and the mole (2.1.3) Anount of formula (2.1.1/2, 1.3) 		C3 Amount of substance	isotopes (2.1.1)	of PEQ on 3.1 – 4.3 – completed
 2.3 Formulae and equations (2.1.2) 3.1 Amount of substance and the mole (2.1.3) 3.2 Determination of formula (2.1.1/2, 1.3) 3.2 Determination of formula (2.1.1/2, 1.3) PAG 1 – calculating empirical formula – practical activity, specific practical skills and analysis skills assessed PAG 2 – Acid – Base titration – 		C4 Acids & redox	2.2 Relative mass (2.1.1)	in class under test conditions –
 (2.1.2) ⇒ PAG 1 – calculating empirical ⇒ 3.1 Amount of substance and the mole (2.1.3) ⇒ 3.2 Determination of formula analysis skills assessed (2.1.2) ⇒ PAG 1 – calculating empirical formula – practical activity, specific practical skills and analysis skills assessed ⇒ PAG 1 – calculating empirical formula – practical activity, specific practical skills and analysis skills assessed 			2.3 Formulae and equations	links to all exams
 3.1 Amount of substance and the mole (2.1.3) 3.2 Determination of formula 4.2 1 1/2 1 3) 5.3 PAG 2 - Acid - Base titration - 			(2.1.2)	PAG 1 – calculating empirical
the mole (2.1.3)specific practical skills and3.2 Determination of formulaanalysis skills assessed(2.1.1/2.1.3)> PAG 2 - Acid - Base titration -			3.1 Amount of substance and	formula – practical activity,
$\Rightarrow 3.2 \text{ Determination of formula} analysis skills assessed$ $(2 \ 1 \ 1/2 \ 1 \ 3) \Rightarrow PAG 2 - Acid - Base titration -$			the mole (2.1.3)	specific practical skills and
(2 1 1/2 1 3) PAG 2 – Acid – Base fitration –			3.2 Determination of formula	analysis skills assessed
			(2.1.1/2.1.3)	PAG 2 – Acid – Base titration –
O PAG I practical activity, specific activity, specific practical difference (2.1.2) practical difference on the second s			\circ PAG I	practical activity, specific
3.3 IVIOLES and VOLUTIES (2.1.3) producted skills and analysis skills			 3.3 Woles and volumes (2.1.3) 3.4 Popeting quantities (2.1.3) 	practical skills and analysis skills
\sim 3.4 Red cling qualities (2.1.5) assessed			 S.4 Reacting quantities (2.1.3) A 1 Acids, bases and 	assesseu
P 4.1 Actus, bases and neutralisation (2.1.4)			neutralisation (2.1.4)	
42 Acid – base titration			2.1.4	
(2.1.4/2.1.3)			(2.1.4/2.1.3)	
o PAG 2			• PAG 2	
➢ 4.3 Redox (2.1.5)			> 4.3 Redox (2.1.5)	
Half-term			Half-term	
Module 2 Module 2		Module 2	Module 2	
Autumn > C5 Electrons & bonding > 5.1 Electron structure (2.2.1) > Module 2 test – 54 marks of PEC	Autumn	C5 Electrons & bonding	5.1 Electron structure (2.2.1)	Module 2 test – 54 marks of PEQ
Term > C6 Shapes of Molecules > 5.2 Ionic bonding and structure covering chapters 2 – 6 –	Term	C6 Shapes of Molecules	5.2 Ionic bonding and structure	covering chapters 2 – 6 –
(2.2.2) completed in class under test			(2.2.2)	completed in class under test
S.3 Covalent bonding (2.2.2) conditions – links to all exams			5.3 Covalent bonding (2.2.2)	conditions – links to all exams
ions (2,2,2)			ions (2,2,2)	Weekly PEQ worth 10 – 20 marks
~ 6.2 Electronegativity and			 6.2 Electronegativity and 	That K5
nolarity (2,2,2)			polarity (2.2.2)	
\rightarrow 6.3 Intermolecular forces (2.2.2)			 6.3 Intermolecular forces (2.2.2) 	
➢ 6.4 Hydrogen bonding (2.2.2)			➢ 6.4 Hydrogen bonding (2.2.2)	
Module 3 Module 3		Module 3	Module 3	
 C7 Periodicity 7.1 The periodic table (3.1.1) PAG 4 – identifying ions and 		C7 Periodicity	7.1 The periodic table (3.1.1)	PAG 4 – identifying ions and
C8 Reactivity trends 7.2 Ionisation energies (3.1.1) writing a method – practical		C8 Reactivity trends	7.2 Ionisation energies (3.1.1)	writing a method – practical
C9 Enthalpy (part) 7.3 Periodic trends in bonding activity, specific practical skills		C9 Enthalpy (part)	7.3 Periodic trends in bonding	activity, specific practical skills
and structure (3.1.1) and analysis skills assessed			and structure (3.1.1)	and analysis skills assessed
$\Rightarrow 8.1 \text{ Group 2 } (3.1.2) \Rightarrow \text{ Weekly PEQ worth } 10 - 20$			➢ 8.1 Group 2 (3.1.2)	Weekly PEQ worth 10 – 20
			 8.2 Line naiogens (3.1.3) 8.2 Qualitative analysis (3.1.4) 	
\sim 8.5 Qualitative analysis (3.1.4)			\sim PAG A	
\bigcirc PAG 4 \searrow 9 1 Enthalow changes (3.2.1)			 FAG 4 9 1 Enthalow changes (3 2 1) 	
\sim 9.2 Measuring enthalow changes			 9.2 Measuring enthalow changes 	
(3.2.1/2.1.3)			(3.2.1/2.1.3)	
Christmas Holiday			Christmas Holidav	

	\triangleright	Module 3	٨	Module 3		
	A A A A A A A A A A A A A A A A A A A	Module 3 C9 Enthalpy C10 Reaction rates & equilibrium Module 4 C11 Basic concepts of organic C12 Alkanes C13 Alkenes	AA AAA AAA AAAA AAA A	Module 3 9.2 Measuring enthalpy changes (3.2.1/2.1.3) \circ PAG 3 9.3 Bond enthalpies $(3.2.1)$ 9.4 Hess' law and enthalpy cycles $(3.2.1)$ 10.1 Reaction rates $(3.2.2/2.1.3)$ 10.2 Catalysts $(3.2.2)$ 10.3 The Boltzmann distribution (3.2.2) 10.4 Dynamic equilibrium and le Chatelier's principle $(3.2.3)$ 10.5 The equilibrium constant Kc – part 1 $(3.2.3)$ Module 4 11.1 Organic chemistry $(4.1.1)$ 11.2 Nomenclature of organic compounds $(4.1.1)$ 11.3 Representing the formula of organic compounds $(4.1.1)$ 11.4 Isomerism $(4.1.1)$ 11.5 Introduction to reaction mechanisms $(4.1.1)$ 12.1 Properties of the alkanes	A A A A	Chapter 9 test – 52 marks of PEQ on 9.1 – 9.4 – completed in class under test conditions – links to exam 1 and 3 Module 3 test – 54 marks of PEQ covering chapters 7 – 10 – completed in class under test conditions – links to exams 1 and 3 PAG 3 – Enthalpy changes – practical activity, specific practical skills and analysis skills assessed Weekly PEQ worth 10 – 20 marks
Spring			AAAA	 12.1 Properties of the alkanes (4.1.2) 12.2 Chemical reaction of the alkanes (4.1.2) 13.1 The properties of the alkenes (4.1.3) 13.2 Stereoisomerism (4.1.3) 		
Term				Half-term		
1						
		Module 4 C13 Alkenes C14 Alcohols C15 Haloalkanes C16 Organic synthesis C17 Spectroscopy	AAA A AAA A AAA	Module 4 13.3 Reaction of alkenes (4.1.3) 13.4 Electrophilic addition in alkenes (4.1.3) 13.5 Polymerisation in alkenes (4.1.3) 14.1 Properties of alcohols (4.2.1) 14.2 Reaction of alcohols (4.2.1) 15.1 The chemistry of the haloalkanes (4.2.2) 15.2 Organohalogen compounds in the environment (4.2.2) 16.1 Practical techniques in organic chemistry (4.2.3) \circ PAG 5 16.2 Synthetic routes (4.2.3) 17.1 Mass spectrometry (4.2.4) 17.2 Infrared spectroscopy (4.2.4)		Chapter 11 - 14 test – 52 marks of PEQ on 11.1. – 14.2 – completed in class under test conditions – links to exam 2 and 3 PAG 5 – Reflux and oxidation of alcohols – practical activity using quick fit apparatus, specific practical skills and analysis skills assessed Weekly PEQ worth 10 – 20 marks

	> Module 4	> Module 4	
	C17 Spectroscopy	> 17.1 Mass spectrometry (4.2.4)	Weekly PEQ worth 10 – 20 marks
		 17.2 Infrared spectroscopy (4.2.4) 	marks
	Revision for mock exam	Revision of modules 2 – 4 content and module 1 practical activities in preparations for the mock exam (see above for detailed content)	Mock Exam – PEQ worth 70 marks covering material from module 1 – 4 – in exam conditions in Constance Green
		N Mardula P	
	> Module 5	 Nodule 5 18.1 Orders, rate equations, and 	
	C18 Rates of reaction	rate constants (5.1.1)	
		18.2 Concentration – time	
		 Provide the second secon	
		graphs and initial rates (5.1.1)	
		Half-term	
Summer	Module 5	Module 5	Chanter 18 10 test E2 marks
Term	 C18 Rates of reaction C19 Equilibrium 	graphs and initial rates (5.1.1)	of PEQ on 18.1 – 19.3 –
	 C20 Acids, bases & pH 	• PAG 9	completed in class under test
		• PAG 10	conditions – links to exam 1 and
		18.4 Rate-determining step (5.1.1)	 PAG 9 – Bate of reaction –
		 18.5 Rate constants and 	practical activity, specific
		temperature (5.1.1)	practical skills and analysis skills
		> 19.1 The equilibrium constant K_c	assessed
		 19.2 The equilibrium constant K_p 	including drawing computer
		(5.1.2)	graphs – practical activity,
		 19.3 Controlling the position of equilibrium (5.1.2) 	specific practical skills and analysis skills assessed
		 20.1 Brønsted – Lowry acids and 	 Weekly PEQ worth 10 – 20
		bases (5.1.3)	marks
		 20.2 The pH scale and strong acids (5.1.3) 	
		 20.3 The acid dissociation 	
		constant K_a (5.1.3)	
		 20.4 The pH of weak acids (5.1.3) 	
		 20.5 pH and strong bases (5.1.3) 	

Notes:

PEQ = Past Exam Questions

In the key/fundamental concepts column the number in the bracket *i.e.*(2.1.1) refer to the specification statements



Course Outline: Chemistry Year 13

	CONTENT	KEY/FUNDAMENTAL CONCEPTS	ASSESSMENT
	 Module 5 C21 Buffers & neutralisation C22 Enthalpy & entropy C23 Redox & electrode potentials 	 Module 5 21.1 Buffer solutions (5.1.3) 21.2 Buffer solutions in the body (5.1.3) 21.3 Neutralisation (5.1.3) PAG 11 22.1 Lattice Enthalpy (5.2.1) 22.2 Enthalpy changes in solution (5.2.1) 22.3 Factors affecting lattice enthalpy and hydration (5.2.1) 22.4 Entropy (5.2.2) 22.5 Free energy (5.2.2) 23.1 Redox reactions (5.2.3) 23.2 Manganate(VII) redox titrations (5.2.3) 23.3 lodine/thiosulfate redox titrations Practical activities: redox titrations 	 Chapter 20 – 21 test – 52 marks of PEQ on 20.1 – 21.3 – completed in class under test conditions – links to exam 1 and 3 PAG 11 – buffers or pH curves – practical activity, specific practical skills and analysis skills assessed Practical activities – redox titrations, including iron - manganate titrations and bleach titrations – practical activity, specific practical skills and analysis skills practiced Weekly PEQ worth 10 – 20 marks
		Half-term	
Autumn Term	 Module 5 C23 Redox & electrode potentials C24 Transition elements Module 6 C25 Aromatic chemistry 	 Module 5 23.4 Electrode potentials (5.2.3) PAG 8 23.5 Predictions from electrode potentials (5.2.3) 23.6 Storage and fuel cells (5.2.3) 24.1 d-block elements (5.3.1) 24.2 The formation and shapes of complex ions (5.3.1) 24.3 Stereoisomerism in complex ions (5.3.1) 24.4 Ligand substitution and precipitation (5.3.1) 24.5 Redox and qualitative analysis (5.3.1) 25.1 Introducing benzene (6.1.1) 25.2 Electrophilic substitution reactions of benzene (6.1.1) 25.3 The chemistry of phenol (6.1.1) 	 Module 4 test – 54 marks of PEQ covering chapters 11 – 17 – completed in class under test conditions – links to exams 2 and 3 Mock Exam – PEQ worth 100 marks covering material from module 1 – 5 – in exam conditions in Constance Green PAG 8 – Electrochemical cells – practical activity, specific practical skills and analysis skills assessed Weekly PEQ worth 10 – 20 marks
		Christmas Holiday	

	 Module 6 C25 Aromatic chemistry C26 Carbonyls & carboxylic acids C27 Amines, amino acids & proteins C28 Organic synthesis 	 Module 6 25.4 Directing groups (6.1.1) 26.1 Carbonyl compounds (6.1.2) 26.2 Identifying aldehydes and ketones (6.1.2) 26.3 Carboxylic acids (6.1.3) 26.4 Carboxylic acid derivatives (6.1.3) 26.4 Carboxylic acid derivatives (6.2.1) 27.1 Amines (6.2.1) 27.2 Amino acids, amides and chirality (6.2.2) 27.3 Condensation polymers (6.2.3) 28.1 Carbon – carbon bond formation (6.2.4) 28.2 Further practical techniques (6.2.5) o PAG 6 	 Module 5 test - 54 marks of PEQ covering chapters 18 - 24 - completed in class under test conditions - links to exams 1 and 3 PAG 7 - Formation of organic compounds - practical activity, specific practical skills and analysis skills assessed PAG 6 - Formation of organic compounds - practical activity, specific practical skills and analysis skills assessed PAG 6 - Formation of organic compounds - practical activity, specific practical skills and analysis skills assessed Weekly PEQ worth 10 - 20 marks
		Half-term	
Spring Term	 Module 6 C28 Organic synthesis C29 Chromatography & spectroscopy 	 Module 6 28.2 Further practical techniques (6.2.5) PAG 6 28.3 Further synthetic routes (6.2.5) 29.1 Chromatography and functional group analysis (6.3.1) 29.2 Nuclear Magnetic Resonance (NMR) spectroscopy (6.3.2) 29.3 Carbon-13 NMR spectroscopy (6.3.2) 29.4 Proton NMR spectroscopy (6.3.2) 29.5 Interpreting NMR spectra (6.3.2) 29.6 Combined techniques (6.3.2) Final PAG PAG 12 – Research skills – research a reaction, write a method, write a risk assessment and then complete the practical activity and process the results 	 Module 6 test – 54 marks of PEQ covering chapters 25 – 29 – completed in class under test conditions – links to exams 2 and 3 PAG 6 – Formation of organic compounds – practical activity, specific practical skills and analysis skills assessed PAG 12 – Research skills – practical activity, specific practical skills and analysis skills assessed Weekly PEQ worth 10 – 20 marks
		Easter Holiday	

	Module 6	Module 6	
Summer Term	 C29 Chromatography & spectroscopy Final PAG <u>Revision</u> 	 > 29.6 Combined techniques (6.3.2) Final PAG > PAG 12 – Research skills – research a reaction, write a method, write a risk assessment and then complete the practical activity and process the results > <u>Revision for final exams</u> 	 Module 6 test – 54 marks of PEQ covering chapters 25 – 29 – completed in class under test conditions – links to exams 2 and 3 Mock exam papers – paper 1, 2 and 3 – full exam papers from previous years – sat in exam conditions in class PAG 12 – Research skills – practical activity, specific practical skills and analysis skills assessed Weekly PEQ worth 10 – 20
		Light to rea	marks
		Hait-term	
	<u>Exams</u>	<u>Exams</u>	<u>Exams</u>