UNIVERSITY FOUNDATION PROGRAMME

CHEMISTRY SPECIFICATION

PREPARING STUDENTS FOR UNIVERSITY SUCCESS

FOR TEACHING FROM 2021

August 2021

CATS UFP

CATS UFP is a Level 3 course, specifically designed to help international students move successfully from secondary education to a UK University.

The CATS UFP is delivered over 420 directed hours of teaching and learning, over 3 subjects, and utilises a rigorous style of study, within a pastorally supportive and culturally stimulating environment that enables students' learning to develop and progress successfully. Students are able to access a variety of assessment methods that are common in UK Universities, such as portfolios, presentations academic posters, and examinations combined with content specifically designed to build on prior learning from courses around the world.

English for Academic purposes is an essential part of CATS UFP, and all students will take an English course that supports their learning and prepares them for university life, as well as having access to many extracurricular activities that further reinforce their use of English. Assessment design within each subject carefully focuses on subject knowledge and skills, rather than the ability to cope with English as a second language.

CATS Colleges provide a stimulating intellectual and diverse environment with small classes; thus, enabling the best learning to happen. With CATS UFP, all learning happens with teachers who have excellent subject knowledge and are expert in creating a positive learning environment for students from a wide range of backgrounds.

CATS UFP has a successful record of accomplishment and is highly respected by UK universities. With this qualification, students with 12 years of schooling from their own country can make the progression that they want, to a wide range of UK universities, including those ranked most highly for both research and teaching. CATS UFP has strong advocates in its alumni, who display what a CATS UFP qualification can give them. Graduates report that they feel very well prepared for university study; often, better prepared than students from other Level 3 programmes. Universities have confirmed this, through testimonials and through extensive consultation with university based External Examiners it has gained excellent credibility with UK universities.

WHY CHOOSE UFP CHEMISTRY

Dynamic and Engaging Content

CATS College has a long history and proven track record of providing high quality, successful Chemistry UFP qualifications that we have continued to improve through teacher and student feedback, operational experience and by working closely with universities and the wider academic community.

The course teaches students theories and experimental techniques to support the learning of the theoretical structure of the atom to the complex organic molecules that are found in many materials and biological systems.

Our content is designed to engage students through topics and issues that are relevant in society.

Real Life Skills

Students will develop the knowledge and skills needed to analyse data, think critically about issues and make informed decisions – all skills that are needed for further study and employment.

Assessment Success

Chemistry UFP involves a blended learning approach to assessing students that enables them to access content and demonstrate a wide range of skills and abilities. There are 2 methods of assessment- coursework and examination papers.

Our coursework uses a variety of assessment styles including group and individual presentations, reflection, citing sources and essays. Topics are contemporary, engaging and developed specifically for international students.

Our examination papers use a variety of assessment styles including multiple choice, short answer, extended answer, data response, essay and case studies so that students feel more confident and engage with the questions.

Real life case studies will be used wherever possible to make it easier for students to relate to and apply their knowledge and skills developed throughout the course.

Sensitivity towards international students

The Chemistry UFP course has been designed to address the challenges that international students will face when studying a British qualification. Coursework and examination assessments are tailor made to ensure students can access, understand, progress and achieve to the best of their abilities.

AIMS OF THE COURSE

Enable students

CATS College wants to enable students to:

- Develop their interest in, and enthusiasm for Chemistry, including developing an interest in further study and careers in Chemistry.
- Appreciate how society makes decisions about scientific issues and how the sciences contribute to the success of the economy and society.
- Develop and demonstrate a deeper appreciation of the skills, knowledge and understanding of how science works.
- Develop essential knowledge and understanding of different areas of Chemistry and how they relate to each other.

HARNESS KEY SKILLS

Students taking this course will be encouraged to develop into independent learners with the ability to think critically, understand the key importance of research and presentational skills. The course covers these key skills in the following ways:

Reasoning and Critical Thinking:

- Use problem-solving skills to interpret and consider situations where more than one approach is possible.
- Select, organise and communicate relevant information in a variety of forms.
- Use mathematical techniques in a multitude of situations applicable to the real world.
- Analyse, explain and evaluate their own and others' experimental and investigative results in a variety of ways.

Independent Learning:

- Organise a student's own learning through management of time and material.
- Work on own initiative to prioritise tasks.
- Work independently to support understanding of material.
- Carry out self-directed learning tasks.

Research Skills:

- Research an area of interest and find data suitable to analyse, statistically if necessary.
- Ensure all research is referenced and not plagiarised.
- Use ICT to develop information literacy skills, to communicate and collaborate with others.

Presentational Skills:

- Systematic documentation of findings and analysis.
- Use of word processing and other forms of ICT for communication.
- Organise information clearly and coherently, using specialist vocabulary where appropriate.

PRIOR KNOWLEDGE

Suggested Prior Subject Specific Topic Knowledge

For most students some previous exposure to formal Chemistry education would be necessary. Specific topic details are not expected, but students who have studied an equivalent national science qualification (for example a Level 1 or 2 qualification, such as GCSE) would be well prepared for UFP Chemistry.

However, experience shows that students will be able to study UFP Chemistry successfully with no background in, or previous knowledge of, Chemistry - in this case their approach to learning will be significant in their need to meet the requirements and pace of the course.

The table below shows prior learning in Chemistry that is recommended to allow the building of the more complex ideas in UFP Chemistry.

Topic	Details
Particulate nature of matter	• Different forms of matter (pure substances [elements, compounds] and mixtures [heterogeneous, homogeneous]); the properties of different states of matter and their interconversion; understanding of how a particular structure relates to the separation and motion of particles.
Atomic structure	• Description of the particles within an atom; definition of atomic number and mass number; explanation of the origin of isotopes; the electronic configurations of atoms; the building-up of electrons in shells.
Periodic Table	• Relationship to electronic configurations of atoms; significance of the electronic structures of the noble gases; importance of outer shell electrons; periodic trends and the prediction of chemical properties for elements in different groups.
Bonding and structure	• Formation of ions resulting in ionic bonding; lattice structures in ionic compounds; covalent bonding involving shared pairs of electrons; single and multiple covalent bonds; shapes of simple covalent molecules; comparison of physical properties (volatility, solubility, melting and boiling point, electrical conductivity) for ionic and covalent compounds; metallic bonding represented as lattice of positive ions in a sea of mobile electrons; explanation of electrical conductivity and malleability of metals.
Quantitative chemistry	Symbols of the elements; formulae of simple compounds; determination of the formula of an ionic compound from the charges on the ions; writing balanced equations with state symbols; the mole concept;

	relative masses (atomic, molecular and formula); quantitative calculations for reactions involving solids, solutions and gases.
Chemical reactions	Types of reaction (precipitation, displacement, acid-base, redox); chemical energetics including the relationship between exothermic/endothermic reactions and bond making/breaking; rate of chemical change including factors that affect the speed of a chemical reaction; extent of a chemical reaction and reversibility.
Organic chemistry	Relationship between names and formulae of organic molecules; structures of simple organic molecules; physical and chemical properties of simple organic molecules (such as alkanes, alkenes and alcohols); polymerisation and synthetic polymers; organic molecules and fuels from petroleum, natural gas and coal.
Practical skills	Knowledge of common apparatus used in experimental work, including apparatus for measurement of time, temperature, mass and volume; techniques for separation (filtration, crystallisation, or distillation); preparation of inorganic salts; techniques for quantitative analysis (titration); techniques for qualitative identification of inorganic compounds.

SUGGESTED PRIOR MATHEMATICAL KNOWLEDGE

In order to access all aspects of the Chemistry UFP course, students need to have acquired competence in the appropriate areas of Mathematics. The required skills are:

- Arithmetic and numerical computations.
- Making use of appropriate units in calculations, expressing answers in decimal and standard form.
- Using ratios, percentage and fractions.
- Handling data by using the correct number of significant figures.
- Finding means and constructing frequency tables, bar charts and histograms.
- Using calculators to find exponential, power and logarithmic functions.
- Order of magnitude calculations.
- Changing the subject of an equation and solving equations.
- Determining slope (gradient) and intercept of a graph.
- In addition, the calculation of area and circumference of circles and volumes and areas of spheres, rectangular block and cylinders should be known.

SUBJECT CONTENT

Examinable Content Overview

The topics in the table below will be assessed through the final examinations.

There is also one self-study topic where students are expected to study the topic themselves with little teacher guidance (an expectation on university courses) – it is highlighted in the syllabus and below in yellow.

There are 4 Modules.

Module 1 – Foundations of Chemistry		Module 1 – Foundations of Chemistry
1.1 Atomic Structure, Isotopes & Relative Masses	Atoms	
1.2 Compounds, Formulae and Equations	Compounds & Equations	
1.3 Mole Calculations	Quantitative Chemistry	
1.4 Acids & Bases and Titrations	pH and working practically	
1.5 Electronic Structure	Arrangement of electrons in atoms	
1.6 Bonding	Including ionic and covalent bonding.	
1.7 Shapes of Covalent Molecules & Intermolecular Forces	Explaining the shape of molecules. How intermolecular forces arise and affect physical properties.	
1.8 Periodic Trends in Physical Properties	Understand the reasoning behind the trends seen in the periodic table.	

Module 2 – Inorganic Chemistry	
2.1 Redox Chemistry	• Understanding oxidation and reduction.
2.2 Inorganic Chemistry – Group 2	• Detail of the group 2 elements and trends.
2.3 Inorganic Chemistry – Group 7/17	• Detail of the group 7 elements and trends.

Module 3 – Organic Chemistry & Analysis	
3.1 Introduction to Organic Chemistry	• A general introduction to the basis of organic chemistry.
3.2 Alkanes	• Naming and explaining the structure and reactions of alkanes.
3.3 Alkenes	• Naming and explaining the structure and reactions of alkenes.

3.4 Haloalkanes	• Naming and explaining the structure and reactions of haloalkanes.
3.5 Alcohols	• Naming and explaining the structure and reactions of alcohols
3.6 Aldehydes, Ketones, Acids & Esters	• Naming and explaining the structure and reactions of aldehydes, ketones, acids & esters
3.7 Benzene and Aromatic Compounds (self-study topic)	• Naming and explaining the structure and reactions of benzene and other aromatic compounds
3.8 Introduction to Organic Synthesis	• A general introduction to the basis of organic synthesis
3.9 Modern Analytical Techniques	• Interpreting spectra of compounds

Module 4 - Physical Chemistry	
4.1 Energetics	• Understanding enthalpy.
4.2 Chemical Kinetics	• Understanding the factors that affect the rate of reaction.
4.3 Chemical Equilibrium	• Understand the term equilibrium and how it is affected.
4.4 Acid-Base Equilibrium	• Interpret and produce titration curves and understand their reasoning

CONTENT DETAILS (SYLLABUS)

Mathematics will account for 15 – 20% of the available marks in the examination- **specific mathematics is highlighted in the syllabus with an asterisk (*) and mentioned in the "prior knowledge" section of the specification.**

Required investigations are highlighted in the syllabus and are required to be completed successfully in order to be awarded with a "Practically Confident" commendation at the end of the course.

Learners should be able to demonstrate and apply their knowledge and understanding of:

Module 1 – Foundations of Chemistry

1.1 Atomic Structure, Isotopes & Relative Masses		
Spec ID	**Assessment statement**	**Additional Guidance**
1.1.1	Understand that the number of protons, neutrons and electrons describes the structure within atoms, and distinguish between atomic number (Z) and mass number (A).	
1.1.2	Construct the nuclear symbol for an atom or ion given the number of protons, neutrons and electrons, and vice versa.	
1.1.3	Understand the definition of isotopes: atoms of an element that have different numbers of neutrons and/or different masses.	
1.1.4	Define relative isotopic mass and relative atomic mass in terms of the mass of an atom of carbon-12.	
1.1.5*	Calculate the relative atomic mass of an element using relative abundances and the relative isotopic masses of its isotopes, as determined by an interpretation of its mass spectrum.	
1.1.6*	Calculate relative molecular mass (Mr) and relative formula mass starting from the relative atomic masses of the constituent elements.	

1.2 Compounds, Formulae and Equations		
Spec ID	**Assessment statement**	**Additional Guidance**
1.2.1	Predict the charge on an ion based on the position of the parent element in the Periodic Table (for Main Group elements in Periods 1, 2, and 3).	
1.2.2	Recall that the following elements in Group 4/14 form more than one ion: Sn, Pb.	
1.2.3	Match the name and formula for the following polyatomic ions: NO3–, CO32–, SO42–, PO43–, OH–, and NH4+.	
1.2.4	Construct the formulae of ionic compounds starting from ionic charges.	
1.2.5	Construct balanced chemical equations for (un)-familiar reactions (based on 1.2.4).	

1.3 Mole Calculations		
Spec ID	**Assessment statement**	**Additional Guidance**
1.3.1	Understand the meaning of the term amount of substance, and recall that the mole, "mol", is the unit for amount of substance.	
1.3.2	Recognise that the number of particles in 1 mol is equal to 6.02 × 1023 (units: mol–1), and that this is called the Avogadro constant, NA.	Constant is in the data book.
1.3.3	Understand that the mass of 1 mole of a substance is called the molar mass (units: g mol–1).	
1.3.4*	Perform mole calculations involving; amount of substance (mol), mass (g), gas volume (dm3, m3), solution volume (cm3, dm3) & concentration (mol dm-3).	
1.3.5	Recognise that the volume of 1 mol of any gas at Room Temperature & Pressure (RTP) is equal to 24.0 dm3 (or 24000 cm3).	

1.3.6*	Use the Ideal Gas Equation: $pV = nRT$ to solve problems involving gases that are not at RTP.	
1.3.7*	Apply mole calculations to balanced chemical equations to calculate the amounts of reactants and products that are involved in a chemical reaction, including calculations: (i) using mass, gas volume, or solution volume/concentration; and (ii) where there is a limiting reagent.	
1.3.8	Understand the meaning of the terms “empirical formula” and “molecular formula”, and calculate: (i) an empirical formula from composition by mass or percentage composition, and (ii) a molecular formula from an empirical formula and a relative molecular mass.	
1.3.9*	Understand the meaning of the terms “anhydrous”, “hydrated” and “water of crystallisation”, and calculate the formula of a hydrated salt starting from its composition by mass or from experimental data.	
1.3.10	Differentiate between the percentage yield of a product in a reaction and the atom economy of the reaction.	
1.3.11*	Calculate the percentage yield of the product in a reaction, and the atom economy of the reaction	
1.3.12	Evaluate the role of atom economy in improving the sustainability of chemical processes.	

1.4 Acids, Bases and Titrations		
Spec ID	**Assessment statement**	**Additional Guidance**
1.4.1	Recall the Arrhenius definition that: (i) acids release H^+ ions in aqueous solution; and (ii) alkalis release OH^- ions in aqueous solution.	
1.4.2	Recall the formulae (and names) of the following: (i) Acids – HCl, HNO_3, H_2SO_4, H_3PO_4 and CH_3COOH; (ii) Alkalis – NaOH, KOH and NH_3.	
1.4.3	Explain the Brønsted-Lowry definition of acids and bases and distinguish between a base and an alkali.	
1.4.4	Apply the Brønsted-Lowry definition of acids & bases to explain qualitatively the difference between strong & weak acids.	
1.4.5	Explain the meaning of the term neutralisation and compose balanced full chemical equations to describe neutralisation reactions between strong / weak acids with the following bases: metal carbonates, metal oxides and metal hydroxides.	
1.4.6	REQUIRED PRACTICAL: Preparation of copper sulphate.	
1.4.7	Employ the relationship between solution concentration, volume, and moles to calculate one of the terms given the other two terms.	
1.4.8	Understand how to prepare a standard solution for use in an acid–base titration, including the equipment required.	
1.4.9	Understand how to perform an acid–base titration, including the equipment required.	
1.4.10*	Carry out and calculate volumetric flask dilutions.	

1.4.11	Apply structured and/or non-structured calculations to determine an unknown concentration, or molar mass, based on experimental results of a titration using (un)-familiar acids and bases.	

1.5 Electronic Structure		
Spec ID	**Assessment statement**	**Additional Guidance**
1.5.1	Recall that the elements are arranged in terms of increasing atomic number (Z) in the Periodic Table.	
1.5.2	Understand what an atomic orbital is: a region of space, outside the nucleus of an atom, which contains a maximum of two electrons with opposite spins.	
1.5.3	Recognise the number of orbitals that make up each of the s, p and d sub-shells, and conclude how many electrons can fill each of the s, p and d sub-shells.	
1.5.4	Understand that electrons fill orbitals in order of increasing energy (Aufbau Principle).	
1.5.5	Explain that, when two or more orbitals have the same energy, electrons occupy each orbital singly before pairing of electrons occurs (Hund's Rule).	
1.5.6	Recall and draw the shapes of s- and p-orbitals	d- orbitals are not required.
1.5.7	Generate the electron configurations of atoms of the first four Periods given their atomic number, Z.	
1.5.8	Recognise that elements in the Periodic Table are organised into s-, p-, d- and f- blocks.	
1.5.9	Generate the electron configurations of ions derived from elements in the s-, p-, and d-blocks, given the atomic number of the element and the ionic charge (for elements up to Z = 36).	
1.5.10	Explain the term first ionisation energy, and the trend in first ionisation energies:	

	(i) across Periods 2 and 3, and (ii) down a Group.	
1.5.11	Explain the term successive ionisation energy and predict the number of electrons in each shell of an atom, and the group to which the element belongs, using successive ionisation energies.	
1.5.12	Explain the trend in atomic radius: (i) across Periods 2 and 3, and (ii) down a Group.	
1.5.13	Recognise that elements in a Period show repeating trends in physical and chemical properties (periodicity) due to their electronic structures.	
1.5.14	Recognise that elements in the same Group have similar chemical properties due to their electronic structures.	

1.7 Shapes of Covalent Molecules & Intermolecular Forces

Spec ID	Assessment statement	Additional Guidance
1.6.1	Explain that an ionic bond results from electrostatic attraction between positive and negative ions and use dot-and-cross diagrams [Lewis structures] to represent the bonding in an ionic compound.	
1.6.2	Explain how the physical properties of ionic compounds – such as melting / boiling point, solubility, and electrical conductivity – can be understood in terms of their ionic bonding.	
1.6.3	Explain that a covalent bond results from electrostatic attraction between a shared pair of electrons and the nuclei of the two atoms forming the bond.	
1.6.4	Construct dot-and-cross diagrams [Lewis structures] to represent the bonding in: (i) covalent molecules, including those containing up to a maximum of 6 electron-dense regions around the	

	central atom, and (ii) polyatomic ions containing covalent bonds.	
1.6.5	Differentiate between single, multiple, and dative covalent bonds.	
1.6.6	Explain that metallic bonding results from electrostatic attraction between metal positive ions (cations) and delocalised electrons and use this bonding model to describe and explain the physical properties of giant metallic lattices.	

1.7 Shapes of Covalent Molecules & Intermolecular Forces		
Spec ID	**Assessment statement**	**Additional Guidance**
1.7.3	Understand the meaning of the term electronegativity, and explain that, when covalently bonded atoms have different electronegativity values, a polar covalent bond results, giving rise to a permanent dipole.	
1.7.4	Use the predictions of VSEPR theory and electronegativity values to deduce whether a covalent molecule is polar or non-polar based on its shape and any permanent dipoles that it contains.	
1.7.5	Explain how intermolecular forces arise for: (i) induced dipole–dipole interactions (London forces), and (ii) permanent dipole– dipole interactions.	
1.7.6	Understand that hydrogen bonding is a force of attraction between the N, O or F atom in one molecule and the H atom of a –NH, –OH or HF group in an adjacent molecule.	
1.7.7	Apply understanding of intermolecular forces to explain: (i) solid structures in simple covalent lattices (halogens, water, noble gases); (ii) anomalous physical properties of NH_3, H_2O, and HF relative to the heavier congeners;	

	(iii) physical properties of covalent compounds with simple molecular lattice structures.	

1.8 Periodic Trends in Physical Properties		
Spec ID	**Assessment statement**	**Additional Guidance**
1.8.1	Apply understanding of covalent bonding to explain how the Group 4/14 elements, carbon and silicon, form giant covalent lattices of atoms and the effect of the structures on their physical properties.	
1.8.2	Apply understanding of covalent bonding to compare and/or contrast the physical properties of the carbon allotropes – diamond, graphite and graphene.	
1.8.3	Combine understanding of bonding (metallic and covalent) theory and intermolecular forces to explain the variation in physical properties of the elements across Period 2 and 3 of the Periodic Table.	

MODULE 2 – INORGANIC CHEMISTRY

2.1 Redox Chemistry		
Spec ID	**Assessment statement**	**Additional Guidance**
2.1.1	Assign an oxidation number to an atom in an element, compound or ion.	
2.1.2	Employ Roman numerals when naming a compound or ion if an atom can have different oxidation numbers.	
2.1.3	Describe the terms oxidation and reduction in terms of changes of oxidation number or electron transfer (electron loss and gain).	
2.1.4*	Balance (un)familiar redox equations using oxidation numbers.	
2.1.5	Create balanced redox equations using given half-reactions (not to include balancing in acidic or basic solution)	
2.1.6	REQUIRED PRACTICAL Understand how to perform a redox titration, including the equipment required.	
2.1.7*	Apply structured and/or non-structured calculations based on experimental results for redox titrations involving MnO_4^- and $I_2/S_2O_3^{2-}$.	

2.2 Inorganic Chemistry – Group 2		
Spec ID	**Assessment statement**	**Additional Guidance**
2.2.1	Recall that the Group 2 elements lose their outer s-electrons in redox reactions to form 2+ ions.	
2.2.2	Recall the relative reactivity of the Group 2 elements with oxygen, water and dilute acids.	

2.2.3	Explain the trend in reactivity of the elements on descending Group 2 in terms of their 1st and 2nd ionisation energies.	
2.2.4	Describe the application of Group 2 compounds in agriculture and in medicine.	

2.3 Inorganic Chemistry – Group 7/17		
Spec ID	**Assessment statement**	**Additional Guidance**
2.3.1	Describe the physical properties of the halogens and explain the trend in their boiling points in terms of intermolecular forces.	
2.3.2	Recall that the Group 7/17 elements gain an electron in redox reactions to form 1– ions.	
2.3.3	Explain the trend in reactivity of the halogens with other halide ions.	
2.3.4	Understand the meaning of the term disproportionation reaction.	
2.3.5	Recall that the reaction of a halogen with water or aqueous sodium hydroxide is an example of a disproportionation reaction.	
2.3.6	Carry out safely and understand that you can identify halides using the reaction of silver ions with aqueous halide ions as an example of a precipitation reaction and write the corresponding ionic equation.	Describe the subsequent reaction of the precipitate with aqueous ammonia to identify the halide ion

Module 3 – Organic Chemistry

3.1 Introduction to Organic Chemistry		
Spec ID	**Assessment statement**	**Additional Guidance**
3.1.1	Understand and apply the IUPAC rules of nomenclature for all organic compounds covered in this course.	Up to 10 carbon atoms in a chain.
3.1.2	Define the terms homologous series and functional group.	
3.1.3	Differentiate between the terms: general formula, structural formula, displayed formula, and skeletal formula.	
3.1.4	Differentiate between: (i) an aliphatic compound (straight/branched chain or alicyclic ring) and an aromatic compound; (ii) a saturated compound and an unsaturated compound.	
3.1.5	Recall that structural isomers are molecules with the same molecular formula but different structural formulae and determine possible structural formulae of an organic molecule.	
3.1.6	Differentiate between homolytic and heterolytic bond fission	
3.1.7	Describe a radical as a species with an unpaired electron.	
3.1.8	Employ a curly arrow to represent the movement of an electron pair in either heterolytic bond fission or covalent bond formation.	

3.2 Alkanes		
Spec ID	**Assessment statement**	**Additional Guidance**
3.2.1	Recall that alkanes are saturated hydrocarbons that only contain single C-C and C-H bonds.	
3.2.2	Apply VSEPR theory to explain the tetrahedral shape and bond angle around each carbon atom in an alkane.	
3.2.3	Understand the meaning of the term σ- (sigma) bond, and that atoms joined by a σ-bond are free to rotate.	
3.2.4	Explain in terms of London forces the variation in the boiling points of alkanes with carbon-chain length and/or branching.	
3.2.5	Understand and explain the low chemical reactivity of alkanes.	
3.2.6	Describe the complete and incomplete combustion of alkanes, as used in fuels.	
3.2.7	Describe the radical substitution reaction of alkanes with halogens (Cl_2 or Br_2), including the mechanism of the reaction.	
3.2.8	Understand the limitations of the radical substitution reaction as a synthetic route to haloalkanes.	

3.3 Alkenes		
Spec ID	**Assessment statement**	**Additional Guidance**
3.3.1	Recall that alkenes are unsaturated hydrocarbons containing a C=C bond.	
3.3.2	Understand that the C=C bond in alkenes comprises a σ-bond and a π-bond and that there is restricted rotation of the π-bond which may lead to geometric isomers.	

3.3.3	Apply VSEPR theory to explain the trigonal planar shape and bond angle around the carbon atoms in the C=C functional group.	
3.3.4	Define stereoisomers as molecules that have the same structural formula, but a different arrangement of the atoms in space, and recognise E/Z and cis–trans isomerism as examples of stereoisomerism.	
3.3.5	Determine E/Z or cis–trans stereoisomers for an organic molecule given its structural formula.	
3.3.6	Apply the Cahn–Ingold–Prelog (CIP) priority rules to identify whether a stereoisomer is E or Z.	
3.3.7	Describe, with experimental details, the addition reactions that alkenes undergo with: (i) hydrogen, (ii) halogens, (iii) hydrogen halides, or (iv) steam.	
3.3.8	Understand the meaning of the term electrophile and derive the mechanism for an electrophilic addition reaction involving an (un)-familiar alkene.	
3.3.9	Apply Markownikoff's rule to predict the distribution of isomers in electrophilic addition reactions between hydrogen halides and unsymmetrical alkenes.	
3.3.10	Describe the addition polymerisation reaction that alkenes and substituted alkenes undergo and deduce the repeat unit of an addition polymer starting from a particular monomer (and vice versa).	
3.3.11	Give examples of how waste polymers may be processed to reduce their environmental impact.	

3.4 Haloalkanes		
Spec ID	**Assessment statement**	**Additional Guidance**
3.4.1	Recognise that haloalkanes can be hydrolysed by aqueous alkali or water.	
3.4.2	Understand the meaning of the term nucleophile and derive the mechanism of a nucleophilic substitution reaction involving the hydrolysis of a primary haloalkane by aqueous alkali [an SN_2 mechanism].	
3.4.3	Explain the trend in the rate of hydrolysis of a primary haloalkane as a function of the halogen functional group.	
3.4.4	Understand how to test qualitatively for the identity of the halogen present in a haloalkane.	
3.4.5	Recall that halogen radicals, derived from the CFC family of haloalkanes, are responsible for the breakdown of ozone in the Earth's upper atmosphere, and write a simple mechanism for the reaction between Cl radicals and ozone molecules.	

3.5 Alcohols		
Spec ID	**Assessment statement**	**Additional Guidance**
3.5.1	Classify alcohols as primary, secondary or tertiary.	
3.5.2	Explain the polarity of alcohols and apply this understanding to explain the solubility of alcohols in water and their relatively low volatility.	
3.5.3	Understand and explain that alcohols undergo the following reactions: (i) substitution reactions with halide ions to form haloalkanes; (ii) elimination reactions to form alkenes; (iii) combustion reactions.	

3.6 Aldehydes, Ketones, Acids & Esters		
Spec ID	**Assessment statement**	**Additional Guidance**
3.6.1	Describe and understand that aldehydes and carboxylic acids are formed from the oxidation of primary alcohols, and that the product can be controlled using different reaction conditions.	
3.6.2	Describe and understand that the oxidation of secondary alcohols leads to the formation of ketones.	
3.6.3	Describe and understand that the oxidation of aldehydes results in the formation of carboxylic acids.	
3.6.4	Recognise that tertiary alcohols are resistant to oxidation under these conditions.	
3.6.5	Describe that the reduction of carbonyl compounds with a hydride ion results in the formation of alcohols.	
3.6.6	Derive the mechanism for the nucleophilic addition reaction of an aldehyde or ketone with the hydride ion.	
3.6.7	Describe the use of 2,4-dinitrophenylhydrazine (Brady's reagent) to detect the presence of a carbonyl group (aldehyde or ketone) in an organic compound.	
3.6.8	Describe the use of Tollens' reagent to detect the presence of an aldehyde group in an organic compound.	
3.6.9	Describe the formation of an ester by the reaction of a carboxylic acid or an acid anhydride with an alcohol (esterification).	
3.6.10	Describe the hydrolysis of an ester: (i) in the presence of an acid to give a carboxylic acid and an alcohol, and (ii) in the presence of aqueous alkali to give a carboxylate salt and an alcohol.	
3.6.11	REQUIRED PRACTICAL	

	Safely carry out the synthesis of cyclohexene. Understanding the procedure and practices for using distillation and reflux to prepare and purify an organic solid.	

3.7 Benzene & Aromatic Compounds (Self Study Topic)

Spec ID	Assessment statement	Additional Guidance
3.7.1	Describe and compare the Kekulé and delocalised model of Benzene.	
3.7.2	Explain the evidence for the delocalisation model using enthalpy changes.	
3.7.3	Be able to name aromatic compounds using IUPAC rules.	
3.7.4	Be able to show (using curly arrows) and explain the electrophilic substitution of aromatics and the conditions required.	With conc. nitric acid & conc. sulphuric acid; with a halogen and halogen carrier; with a haloalkane (and the Friedel-Crafts reaction)

3.8 Introduction to Organic Synthesis

Spec ID	Assessment statement	Additional Guidance
3.8.1	Identify functional groups in an organic molecule and predict the properties and reactions of an organic molecule containing several functional groups.	
3.8.2	Utilise and develop a Spider Diagram summarising all organic reactions covered in the Chemistry UFP course.	
3.8.3	Be able to devise a synthetic route (involving no more than two-steps) from a given reactant to a desired product by applying transformations between the different functional groups studied in the course.	

3.9 Modern Analytical Techniques		
Spec ID	**Assessment statement**	**Additional Guidance**
3.9.1	REQUIRED PRACTICAL Safely carry out and understand how to identify organic compounds.	
3.9.2	Interpret the infrared spectrum of an organic compound to identify the presence of the following functional groups: (i) the OH group in an alcohol from the absorption peak of the O–H bond; (ii) the carbonyl group of an aldehyde or ketone from the absorption peak of the C=O bond; (iii) the COOH group of a carboxylic acid from the absorption peak of the C=O bond and the broad absorption peak of the O–H bond, and (iv) the C=C group in an alkene from the absorption peak of the C=C bond.	Infrared absorption data are given in the databook
3.9.3	Interpret the mass spectrum of an organic compound in order to: (i) determine its molecular mass from the molecular ion peak; (ii) analyse fragmentation peaks in order to distinguish between different structures.	
3.9.4	Deduce the structure of an organic molecule from a combination of analytical data such as its: elemental analysis, mass spectrum and infrared spectrum.	

MODULE 4 – PHYSICAL CHEMISTRY

4.1 Energetics		
Spec ID	**Assessment statement**	**Additional Guidance**
4.1.1	Define the terms: (i) standard conditions and standard states; (ii) enthalpy change of reaction ($\Delta_r H$), enthalpy change of formation ($\Delta_f H$), enthalpy change of combustion ($\Delta_c H$), and enthalpy change of neutralisation ($\Delta_n H$).	
4.1.2	Differentiate between enthalpy changes which are exothermic (ΔH, negative) or endothermic (ΔH, positive).	
4.1.3	Construct an enthalpy profile diagram to illustrate the activation energy for a reaction, as well as the difference in the enthalpy of reactants compared with that of the products.	
4.1.4	Explain how enthalpy changes associated with the breaking and making of chemical bonds result in a chemical reaction being either exothermic or endothermic.	
4.1.5*	Define the term (average) bond enthalpy, and calculate an enthalpy change of reaction, or related quantities, using values for average bond enthalpy.	
4.1.6	REQUIRED PRACTICAL Understand the techniques and procedures used to calculate enthalpy changes directly from temperature measurements, starting from appropriate experimental results, applying the equation $q = m\,c\,\Delta T$.	Equation given in the databook
4.1.7	Understand the techniques and procedures employed to determine enthalpy changes indirectly (Hess' Law).	
4.1.8	Apply Hess' law to determine the enthalpy change of a reaction from: (i) enthalpy changes of combustion, (ii) enthalpy changes of formation, or (iii) unfamiliar enthalpy changes.	Enthalpy cycles or thermochemical equations may be employed to demonstrate Hess' Law.
4.1.9	Understand that lattice enthalpy (ΔH negative) refers to the process in which gaseous ions combine to form a	

	solid ionic lattice and is a measure of ionic bond strength.	
4.1.10*	Use a Born–Haber cycle to calculate the lattice enthalpy of a simple ionic solid.	It is not required to construct the Born-Haber cycle itself.
4.1.11*	Understand the terms enthalpy change of solution and enthalpy change of hydration, and use a Born–Haber cycle with two of the enthalpy changes (enthalpy change of solution, enthalpy change of hydration of an ion, and lattice enthalpy) to calculate the third enthalpy change term.	
4.1.12	Explain qualitatively the effect of ionic charge and ionic radius on:	

4.2 Chemical Kinetics		
Spec ID	**Assessment statement**	**Additional Guidance**
4.2.1	REQUIRED PRACTICAL Understand what is meant by the term rate of reaction, and how to measure and calculate a rate of reaction by monitoring how a physical quantity changes with time.	
4.2.2	Understand what is meant by collision theory and describe qualitatively the effect of concentration and pressure changes (for gases) on the rate of a reaction in terms of the frequency of collisions.	
4.2.3	Explain qualitatively, using a Boltzmann distribution curve, the effect of temperature change on reaction rate and its relevance to activation energy.	
4.2.4	Explain the role of a catalyst in a chemical reaction and interpret catalytic behaviour in terms of a Boltzmann distribution curve.	
4.2.5	Differentiate between a heterogeneous catalyst and a homogeneous catalyst, giving examples.	
4.2.6	Understand the economic and environmental importance of catalysis in chemical processes.	

4.2.7	Deduce the instantaneous rate of a reaction from a concentration–time graph derived from experimental results.	
4.2.8	Understand the meaning of the term reaction order and deduce the reaction order for a particular reactant:	
4.2.9	Derive from reaction orders the rate equation for a chemical reaction.	
4.2.10*	Understand the meaning of the term rate constant and how to calculate a rate constant including its units.	
4.2.11*	Understand the term half-life and calculate the half-life of a first-order reaction from a concentration–time graph.	
4.2.12	Understand the Arrhenius relationship and how it describes the effect of a temperature change on the rate of a reaction.	

4.3 Chemical Equilibrium		
Spec ID	**Assessment statement**	**Additional Guidance**
4.3.1	Understand how a dynamic equilibrium arises in a closed system.	
4.3.2*	Deduce an expression for the equilibrium constant, Kc, for a homogeneous chemical reaction and calculate the value of Kc (including its units) from equilibrium concentrations.	
4.3.3*	Calculate the amount of reactants and products present at equilibrium, given appropriate data.	
4.3.4	Estimate the position of equilibrium from the magnitude of Kc.	
4.3.5	Apply Le Chatelier's Principle to predict the effect on the position of equilibrium and the value of Kc of the following changes: (i) temperature; (ii) concentration or pressure; (iii) addition of a catalyst.	

4.3.6	Explain, using Le Chatelier's Principle, why chemists may need to select optimum conditions for an industrial chemical reaction that involve a compromise between chemical equilibrium and reaction rate.	

4.4 Acid-Base Equilibrium

Spec ID	Assessment statement	Additional Guidance
4.4.1	Understand the meaning of the term conjugate acid–base pair and identify the conjugate acid-base pairs in a chemical reaction.	
4.4.2*	Define the term pH and calculate pH for a strong acid.	
4.4.3	Understand that the acid dissociation constant Ka describes the extent of dissociation of a weak acid in solution and deduce an expression for Ka.	
4.4.4*	Calculate Ka for a weak acid, given appropriate data.	
4.4.5	Understand the practical uses for buffers.	
4.4.6	Define and use the ionic product of water Kw. [the value of Kw at 25°C is given in the databook]	
4.4.7*	Calculate the pH of a solution for: (i) a weak monobasic acid; (ii) a strong base.	
4.4.8	Explain the key features of titration curves involving strong and weak acids and bases.	
4.4.9	Explain the role of an indicator in a titration and be able to select an appropriate indicator for a given titration using suitable information.	

COURSE ASSESSMENT

ASSESSMENT OBJECTIVES

Assessment objectives (AOs) are the same across all Level 3 Science specifications and all exam boards. The Chemistry UFP will also place a stronger emphasis on the use of chemistry in an international context compared to other Level 3 qualifications.

Objective	Objective Detail	Overall Course Weighting
AO1	Demonstrate knowledge and understanding of scientific ideas, processes, techniques and procedures • scientific evidences and concepts • scientific methods and systems • scientific terminology • logical presentation of scientific information	20 – 25%
AO2	Apply knowledge and understanding and use: • scientific evidences and concepts • scientific methods and systems • scientific terminology to transfer information efficiently • suitable logical steps are evident to present scientific information	30- 35%
AO3	Analyse, interpret and evaluate scientific information, ideas and evidence, including in relation to issues, to: • aim, research questions and predictions • scientific methods and systems • scientific explanations of concepts, projects and investigations	25 - 30%
AO4	Demonstrate the appropriate research, experimental skills, and personal skills necessary to carry out insightful and ethical investigations and presentations: • develop and apply 21st century communication skills • become critically aware, as global citizen, of the ethical implications of using science and technology • carry out practicals in groups effectively	15 – 20%

ASSESSMENT OBJECTIVE WEIGHTING PER COURSE ELEMENT

Course Element Information			**Assessment Objective Weighting**			
Type of Assessment	**Name of Assessment**	**Overall Course %**	**AO1**	**AO2**	**AO3**	**AO4**
MCQ Exam	**Basics of Science**	7				
MCQ Exam	**Beyond Basics**	13	30 – 40%	40 – 50%	20 – 30%	
Exam	**Written Exam**	40				
Coursework	**Poster**	15			45 – 55%	45 – 55%
Coursework	**Presentation**	10		40 – 50%	30 – 40%	30 – 40%
Controlled Assessment	**Practical Write Up**	15		40 – 50%	30 – 40%	30 – 40%
Practical Skills	**Practically Confident**	n/a				
Totals (Considering Weighting)		**100**	**20 – 25%**	**30 – 35%**	**25 – 30%**	**15 – 20%**

N.B. In the Examinations Mathematics will account for 10 – 15% of the available marks.

ASSESSMENT STRUCTURE OVERVIEW

Chemistry UFP involves five methods of assessment:

- A scientific research poster – relating a subject matter from Chemistry to another subject.
- A presentation – Presenting a selected Chemistry subject.
- 3 examination papers – 2 Multiple Choice Papers and one written exam.
- A controlled assessment - a practical write up of a practical given to you.
- A "Practically Confident" teacher assessment of your practical skills throughout the course.

Assessment Name	% Weighting	Marks Available	Additional Information
Coursework 1 - Poster	15	36	• Relating a subject matter from Chemistry to another subject
Coursework 2 - Presentation	10	24	• Presenting a selected Chemistry subject.
Controlled Assessment – Practical Writeup	15	36	• A practical write up of a practical provided to you.
Practically Confident	n/a	n/a	• Required practicals assessed by your teacher throughout the course.
Exam Paper 1 – Basics of Chemistry	7	20	• Multiple Choice Paper on Modules 1 & 2 only. • 30 minutes.
Exam Paper 2 – Beyond the Basics of Chemistry.	13	30	• Multiple Choice Paper on all topics. • 45 minutes.
Exam Paper 3 – Written Paper	40	90	• Long and short answer questions on all topics (including practical applications mentioned in the syllabus and self-study topic) • 2 hour 15 minutes.

An overall grade in Chemistry is given at the end of the course.

ASSESSMENTS

Coursework 1 - Poster

The Poster topics must be different for each science and based on the science under study, however, the assessment requirements are the same for biology, chemistry and physics.

The poster is worth 15% of the course and consists of the following stages:

- Students pick an appropriate subject (in the form of a specific question) that relates a topic from the science being studied to a cross curricular issue, some examples are:

Chemistry - Why is chemistry required for XXXXXX?	Business / Economics - How has XXXXXX shaped the economy?
Physics - Why does physics provide answers to XXXXXX?	Maths - How maths and XXXXXX aim to find solutions.
Biology - How can Biology help XXXXXX?	History - What in history has shaped XXXXXX?
General Science - How has working together helped solve XXXXXX?	Law - How does law shape XXXXX?

- A short-written article of why the topic was chosen by the student and why it is important to others.
- A written report of 1500 words that allows you to discuss research in more detail (not including references).
- An abstract (a summary of the key points of your research) of 250 words.
- Production of a digital A1 sized poster using the information from your essay and including appropriate referencing of sources and an abstract that summarises your research.
- Your written reflections regarding - on your production of the poster; the sources used and the extending the ideas of your research.

The mark scheme, documents that need to be provided and additional information for the poster is in the appendix of this document.

Coursework 2 – Presentation
The Presentation is worth 10% of the course and consists of the following stages:

- Students will be given a transition element to research by their subject teacher from the 4th – 6th periods only.

- An 8 – 12-minute presentation should be produced and given that answers the following:

    - Deduce the electron configurations of atoms and ions.
    - Shown the existence of more than one oxidation state.
    - Show use of the terms d-block elements and transition elements.
    - Show the formation of coloured ions and include balanced equations with state symbols.
    - Identify and use the terms “deprotonation reaction” and “ligand-substitution” reaction.
    - Show the catalytic behaviour of the transition elements and/or their compounds.
    - Compare the redox behaviour in the reactions of transition elements.

- Your reflections on your production of the presentation, the used sources and the general ideas of your presentation will take place verbally after your presentation has been given.

The mark scheme, documents that need to be provided and additional information for the presentation is in the Assessment Guidance document.

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Controlled Assessment – Practical Writeup
A practical will be viewed by students in their own time.

Raw data will be provided.

Students will have 1 week to complete the task independently and it consists of the following stages:

- Writing a method.
- Carrying out a risk assessment.
- Drawing an appropriate table.
- Drawing an appropriate graph.
- Writing a conclusion.
- Evaluating the method.

The mark scheme, documents that need to be provided and additional information for the practical writeup is in the Assessment Guidance document.

Practically Confident

Students will achieve a "Practically Confident" grade upon successful completion of the required practical procedures and analysis during the course.

Students will be awarded with a "Practically Confident Shown" grade if they meet the requirements of the required practicals as judged by their subject teacher – please see "required Investigations" section for more details.

The requirements for each practical to be deemed as "Confidence Shown" shall be that the practical has been:

- Carried out effectively (either in a group or individually) – Teacher judgment based on raw data.
- Analysed correctly – Teacher judgement based upon viewing appropriate presentation of data in tabular and/or graph form (where appropriate).
- Evaluated appropriately – Teacher judgment based upon written evaluation of procedure after carrying out the investigation.

Teachers will be given a spreadsheet to record the date of when the 3 criteria above for each practical have been reached.

This will then be monitored by your teacher so as the "practically confident" grade is given or not stated.

Required Practicals

Chemistry is the study of life. Biologists attempt to understand the living world at all levels using many different methods and procedures. Students are expected to gain an understanding of how a scientific investigation is carried out.

The following practicals are a requirement of the course.

Students must complete all the below practicals successfully throughout the course in order to be awarded with the "Practically Confident Shown" grade to be awarded.

Students who miss or do not reach the requirements mentioned in the section for the "Practically Confident" material are responsible for arranging another suitable time with their teacher to show they have reached the criteria.

The required practicals

- Preparation of copper sulfate (or similar).
- Successfully carrying out of a redox titration.
- Identifying Organic compounds.
- Measuring the enthalpy change.
- Measuring the rate using a single indicator (eg gas volume)
- Organic synthesis (eg cyclohexene).

Exam Papers

Exam Paper 1 – Basics of Chemistry

This paper is a multiple-choice paper and will mostly consist of AO1 questions.

It will be under controlled conditions, worth 20 marks and last for 30 minutes.

It will assess only:

1.1 Atomic Structure, Isotopes & Relative Masses
1.2 Compounds, Formulae and Equations
1.3 Mole Calculations
1.4 Acids & Bases and Titrations
1.5 Electronic Structure
1.6 Bonding
1.7 Shapes of Covalent Molecules & Intermolecular Forces
1.8 Periodic Trends in Physical Properties
2.1 Redox Chemistry
2.2 Inorganic Chemistry – Group 2
2.3 Inorganic Chemistry – Group 7/17

Exam Paper 2 – Beyond the Basics of Chemistry

This paper is a multiple-choice paper and will mostly consist of AO1& AO2 questions.

It will be under controlled conditions, worth 30 marks and last for 45 minutes.

It will assess all areas of the course (including practical applications mentioned in the syllabus and self-study topic).

Exam Paper 3 – Written Paper

This paper is a long and short answer questions paper and will mostly consist of AO2 & AO3 questions.

It will be under controlled conditions, worth 90 marks and last for 2 hours 15 minutes.

It will assess all areas of the course (including practical applications mentioned in the syllabus and self-study topic).

PLANNING
Suggested Teaching Plan

Spec ID	Topic	Recommended Hours	Recommended Teaching Month (September Start)	Recommended Teaching Month (Fast Track)
1.1	**Atomic Structure, Isotopes & Relative Masses**	5	September	January
1.2	**Compounds, Formulae and Equations**	5	September	January
1.3	**Mole Calculations**	10	September	January
1.4	**Acids & Bases and Titrations**	10	September / October	January
1.5	**Electronic Structure**	5	October	January
1.6	**Bonding**	5	October	January
1.7	**Shapes of Covalent Molecules & Intermolecular Forces**	5	October / November	January / February
1.8	**Periodic Trends in Physical Properties**	5	November	January / February
2.1	**Redox Chemistry**	5	November	February
2.2	**Inorganic Chemistry – Group 2**	5	November / December	February
2.3	**Inorganic Chemistry – Group 7/17**	5	December	February
Review & Prepare for Exam Paper 1 – Basics of Chemistry		(5)	December / January	Review & Prepare for Exam Paper 1 – Basics of Chemistry
3.1	**Introduction to Organic Chemistry**	5	December / January	February / March
3.2	**Alkanes**	5	January	March
3.3	**Alkenes**	5	January	March
3.4	**Haloalkanes**	5	January	March
3.5	**Alcohols**	5	February	March
3.6	**Aldehydes, Ketones, Acids & Esters**	5	February	March / April
3.7	**Benzene and Aromatic Compounds**	(5 self-study topic)	n/a	n/a
3.8	**Introduction to Organic Synthesis**	5	February / March	March / April

3.9	**Modern Analytical Techniques**	5	March	April
4.1	**Energetics**	10	March	April
4.2	**Chemical Kinetics**	10	March / April	April
4.3	**Chemical Equilibrium**	5	April	May
4.4	**Acid-Base Equilibrium**	10	April / May	May
Review & Prepare for Exam Papers 2 & 3		(5)	May **Exam Papers 2 & 3**	May **Exam Papers 2 & 3**

Total = 140 Hours teacher contact time minimum.

- Students are expected to supplement this contact time with revision, completion of homework and extra reading around the subject.
- Any relevant information that demonstrates extended reading may be awarded credit in the exam if no other creditable information is provided.

COURSEWORK DEADLINES & SUGGESTED PLANNING

All assessment work will be marked centrally and anonymously..

All coursework documents need to be submitted to your teacher digitally (MS Office) for checking on similarity detection software and for marking and moderation.

A first draft of your coursework **(not the controlled assessment)** can be handed to your teacher for feedback if received within the deadline.

Missing the deadline is not acceptable – if you miss the teacher feedback deadline the teacher reserves the right to not give feedback before the final hand in date.

The final deadline is when work needs to be uploaded for moderation and marking, therefore, if this deadline is missed the teacher reserves the right to only award on what has been seen or award 0 marks.

Coursework	Task in Coursework	Deadline for September Start	Deadline for Fast Track	Notes
Coursework 1 – Poster	Selecting an appropriate Question.	Before October Half – Term	Before February Half – Term	This should be discussed with your teacher before moving onto other tasks.
Coursework 1 – Poster	First draft of Coursework completed so far (not including reflections).	Last Week in November	Last Week in February	Your Teacher will mark what is provided and give verbal or written feedback.

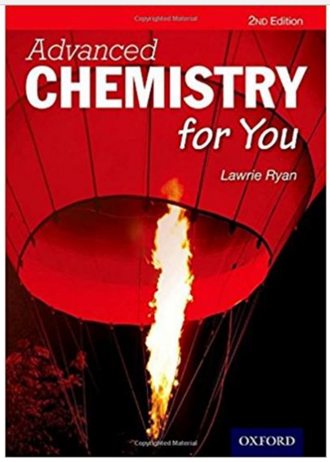
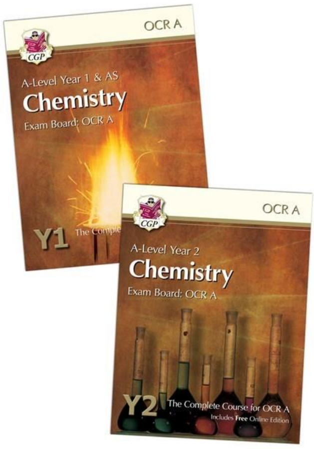
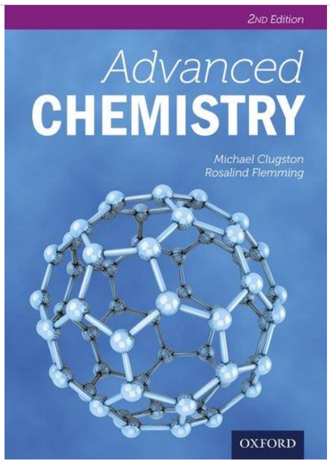
Coursework 1 – Poster	Coursework completed and digitally sent.	January – the week of exam paper 1.	March – the week of exam paper 1.	Requirements of documents to be provided are in the appendix of this document.
Coursework 1 – Poster	Reflections	End of the week of exam paper 1.	End of the week of exam paper 1.	To be completed after the poster hand in.
Coursework 2 – Presentation	Research topic given.	Before February Half – Term	After Paper 2 & 3.	This should be confirmed with your teacher before moving onto other tasks.
Coursework 2 – Presentation	First draft of Coursework completed so far (not including reflections).	First week in March.	1 week after Paper 2 & 3.	Your Teacher will mark what is provided and give verbal or written feedback.
Coursework 2 – Presentation	Coursework completed, digitally sent and presented.	First week after Easter vacation.	2 weeks after Paper 2 & 3.	Requirements of documents to be provided are in the appendix of this document.
Controlled Assessment – Practical Writeup	Coursework Given to students	First week of May	First week of May	This will be sent to you to your e-mail address by the Chief Examiner.
Controlled Assessment – Practical Writeup	Coursework completed and digitally sent.	Second week of May	Second week of May	Requirements of documents to be provided are in the appendix of this document.

For these assessment elements of the course, marks for each element of the marking criteria will be awarded on a points system. Each "Seen Expansively" will be worth three points, each "seen clearly" will be worth two points, each "Seen, but vaguely" will be worth one point, and each "Not Seen" is not worthy of credit.

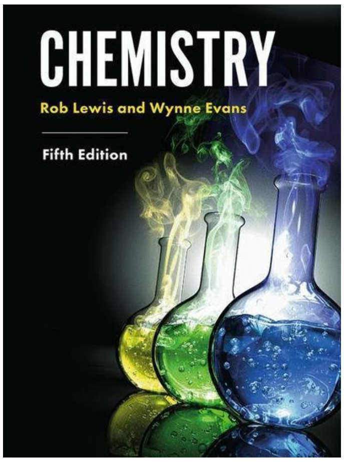
	Points awarded				
Marking Statement	**Not Seen**	**Seen, but vaguely**	**Seen clearly**	**Seen expansively**	**Comment as to why points were awarded**
	0	**1**	**2**	**3**	•

SUPPORT & INFORMATION

Suggested Reading Material

Textbook Name & Author	Front Cover	Publisher & Edition
Advanced Chemistry for you **LAWRIE RYAN**		OUP Oxford University Press 2nd Edition
A Level Chemistry for OCR A **CGP Books**		CGP Books 1st Editions
Advanced Chemistry **(Advanced Sciences)** **CLUGSTON & FLEMMING**		Oxford University Press 2nd Edition

Chemistry - Macmillan Foundations Series
LEWIS & EVANS



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5th Edition

ACADEMIC HONESTY

All work should be your own and you may be required to declare that it is indeed all your own work.

All work will be checked by the similarity checker and therefore must be provided in a digital format.

If it is believed that the work is not your own due to it being different to other pieces of work and / or scores highly in the similarity checker, you may be asked to redo the work, attend a viva or be given zero marks for that particular area.

EAL (ENGLISH AS AN ADDITIONAL LANGUAGE)

Students can access the English support offered in their respective CATS College.

Lessons are taught using a Content and Language Integrated Learning (CLIL) approach, so that students can also develop their English language skills.

The course has been designed for international students and therefore, even though the course is conducted in the English language, opportunities to award skills have been considered and teachers are trained in teaching EAL students.

Most UFP students will be expected to attend an EAP programme as Universities will require a workable understanding of the English Language.

SEND (SPECIAL EDUCATIONAL NEED AND DISABILITIES)

Students can discuss any SEND concerns in their respective CATS College.

Support and extra time will be granted through the SEND coordinator at the respective CATS College in conjunction with the UFP board.

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