

# ANNUAL PLAN FOR CHEMISTRY, KEY STAGE 5, A LEVEL, EDEXCEL (2021-22)

		<b>Key Concepts</b> 	
<b>Term 1, September – December</b>	<ul style="list-style-type: none"> <li>• Further Kinetics</li>   <li>• Entropy and energetics</li>   <li>• Chemical Equilibria</li>   <li>• Acid-base Equilibria</li>   <li>• Organic chemistry: carbonyls, carboxylic acids and chirality</li>   <li>• Redox Equilibria</li> </ul>	<ul style="list-style-type: none"> <li>• Techniques for measuring the rate of reaction</li> <li>• Rate of reactions, rate constants and orders of reaction</li> <li>• Determining orders of reaction</li> <li>• Rate equations and mechanisms</li> <li>• Activation energy and catalysis</li> <li>• Effect of temperature on the rate constant</li>   <li>• Introduction to entropy</li> <li>• Total entropy</li> <li>• Understanding entropy changes</li> <li>• Lattice energy and Born Haber cycles</li> <li>• Experimental and theoretical lattice energies</li> <li>• Enthalpy changes of solution and hydration</li>   <li>• Equilibrium constant, <math>K_c</math></li> <li>• Equilibrium constant, <math>K_p</math></li> <li>• Factors affecting equilibrium constants 1</li> <li>• Factors affecting equilibrium constants 2</li> <li>• Relating entropy to equilibrium constants</li>   <li>• The Bronsted-Lowry theory</li> <li>• Hydrogen ion concentration and the pH scale</li> <li>• Ionic product of Water, <math>K_w</math></li> <li>• Analysing data from pH measurements</li> <li>• Acid-base titrations, pH curves and indicators</li> <li>• Buffer solutions</li> <li>• Buffer solutions and pH curves</li>   <li>• Chirality and enantiomers</li> <li>• Optical activity</li> <li>• Optical activity and reaction mechanisms</li> <li>• Carbonyl compounds and their physical properties</li> <li>• Redox reactions of carbonyl compounds</li> <li>• Nucleophilic addition reactions</li> <li>• Carboxylic acids and their physical properties</li> <li>• Preparations and reactions of carboxylic acids</li> <li>• Carboxylic acids derivatives: acyl chlorides</li> <li>• Carboxylic acid derivatives: Esters</li> <li>• Carboxylic acid derivatives: Polyesters</li> <li>• Simple chromatography</li> <li>• Determining structures using mass spectra</li> <li>• Chromatography: HPLC and GC</li> <li>• Chromatography and mass spectrometry</li> <li>• Principles of NMR Spectroscopy</li> <li>• C NMR Spectroscopy</li> <li>• H NMR Spectroscopy</li> <li>• Splitting patterns in H NMR Spectra</li>   <li>• Standard electrode potentials</li> <li>• Electrochemical cells</li> <li>• Standard electrode potentials and thermodynamic feasibility</li> <li>• Redox in action – Fuel cells</li> <li>• Redox titrations</li> </ul>	<b>120</b>

Term 2, January – March	<ul style="list-style-type: none"> <li>Transition metals</li> <li>Benzene and its compounds. Arenes</li> <li>Organic Nitrogen compounds: Amines, Amides, Amino acids and Proteins</li> <li>Organic synthesis</li> <li>Practical Skills 2</li> </ul>	<ul style="list-style-type: none"> <li>Transition metal electronic configurations</li> <li>Ligands and complexes</li> <li>The origin of colour in complexes</li> <li>Common shapes of Complexes</li> <li>Square planar complexes</li> <li>Multidentate ligands</li> <li>Different types of reactions for transition metals</li> <li>Reactions of cobalt and iron complexes</li> <li>The chemistry of chromium</li> <li>Reactions of manganese complexes</li> <li>The chemistry of vanadium</li> <li>Reactions of nickel and Zinc complexes</li> <li>Transition metals as catalysts. Heterogeneous catalysts.</li> <li>Homogeneous catalysts</li> <li>The Benzene ring: A molecule with two models</li> <li>Reactions of arenes</li> <li>Electrophilic substitution mechanisms</li> <li>Phenol</li> <li>Amines and their preparations</li> <li>Acid-base reactions of amines</li> <li>Other reactions of amines</li> <li>Amides and Polyamides</li> <li>Amino acids</li> <li>Peptides and proteins</li> <li>Organic analysis</li> <li>Organic synthesis</li> <li>Hazards, risks and control measures</li> <li>Practical techniques in Organic Chemistry</li> </ul>	88
Term 3, April – June	<ul style="list-style-type: none"> <li>Revision</li> </ul>		104
	Exams	Exams	
			312