

BRACKEN RIDGE STATE HIGH SCHOOL

Year 11/12 Chemistry

Over the 2 year senior course students will study the following units, the sequence is determined by school conditions

ALLOCATION AND LENGTH	UNIT	SUB TOPICS	ASSESSMENT
Year 11 Term 1 – 10 weeks	Our Chemical Universe	<ul style="list-style-type: none"> • Atoms, ions, compounds and molecules • Ionic, covalent and metallic bonding • Chemical reactions and balancing equations • The mole and stoichiometry • Periodicity – study of the Periodic Table 	<ul style="list-style-type: none"> • Supervised assessment 1½ hours
Year 11 Term 2 – 10 weeks	Water	<ul style="list-style-type: none"> • Properties of water • Determine the rules of solubility and gain an understanding why water is known as the universal solvent • Mass, mole and molarity • Compare and contrast intermolecular and intramolecular bonds • Study of polarity and polar molecules • Water quality testing 	<ul style="list-style-type: none"> • Practical examination 1½ hours • Extended Experimental Investigation
Year 11 Term 3 or Year 12 Term 3 – 10 weeks	Organic Chemistry	<ul style="list-style-type: none"> • Investigate organic compounds, hydrocarbons and hydrocarbon derivatives • Discuss properties and structure of alkanes, alkenes, alkynes, alkanols, alkanals, alkanones, haloalkanes, esters and alkanic acids • Investigate the history and relevance of beer and wine making. • Compare the composition of grape juice to wine. • Investigate types of wine and beer – their similarities and differences 	<ul style="list-style-type: none"> • Supervised assessment 1½ hours
Year 11 Term 4 or Year 12 term 4 – 10 weeks	Energy	<ul style="list-style-type: none"> • Discuss energy forms and the combustion of fossil fuels for transport and in power stations for electricity • Compare and contrast exothermic and endothermic process and reactions • The relationship between heat and temperature • Define enthalpy and entropy and activation energy • Calculate the heat of a reaction using bond energies and calorimetry • Compare spontaneous to non-spontaneous reactions • Investigate rates of a reaction 	<ul style="list-style-type: none"> • Practical examination 1½ hours
Year 12 Term 1 – 10 weeks	Equilibrium	<ul style="list-style-type: none"> • Compare and contrast physical and chemical equilibrium to a steady state • Compare reversible reactions to one way reactions 	<ul style="list-style-type: none"> • Supervised assessment 2½ hours

		<ul style="list-style-type: none"> • Discuss the uses of the equilibrium constant (K_{eq}) in chemical processes • Calculate the pH of variety of substances • Strength of acids and bases in terms of the degree of dissociation. • Perform titrations to determine concentrations of unknown solutions using monoprotic, diprotic and triprotic acids • Students gain an understanding of the buffering capacity of solutions and are exposed to conjugate acids and bases which examine equilibrium 	
Year 12 Term 2 – 10 weeks	You, the analytical chemist	<p>Students will investigate the procedures involved in chemical analysis which forms the focus on quality control. They will perform a variety of qualitative and quantitative testing on products or items e.g. chromatography, flame testing, volumetric and gravimetric analysis.</p> <p>Possible topics which students may investigate include:</p> <ul style="list-style-type: none"> • Comparing the ions and possible compounds found in a variety of spring and mineral waters. • Calculate the cost per millilitre of several different brands of vinegar. Compare the quality of each brand by taste. Do the more expensive vinegars taste better? Is the price difference justified? • Calculate the amount of ascorbic acid in a vitamin C tablet or fruit juice. Use this information compare brands and or juices. 	<ul style="list-style-type: none"> • Extended Experimental Investigation
Year 11 Term 3 or Year 12 term 3 – 10 weeks	Corrosion	<ul style="list-style-type: none"> • Comparing metallic structure and bonding to properties of metals • Study of the chemistry behind corrosion of metals and the factors that slow or prevent this process • Oxidation and reduction reactions • Compare and contrast electrochemistry and electrolysis • Study of voltaic and galvanic cells 	<ul style="list-style-type: none"> • Supervised assessment 2¹/₂ hours
Year 11 Term 4 or Year 12 term 4 – 10 weeks	Gases and scuba diving	<ul style="list-style-type: none"> • Study of the gases in the atmosphere • Property of gases and the gas laws: Boyles, Charles, Avadagro's, Gay-Lussacs, Henry's, Combined gas law and the Ideal gas law • Apply gas laws to scuba diving and investigate the causes of nitrogen narcosis, the bends and oxygen toxicity 	<ul style="list-style-type: none"> • Practical examination 2¹/₂ hours