KS5 Long Term Curriculum Plan: BTEC Science Year 12 2023-2024

Curriculum Aim: In A Level Biology we extend on the knowledge of GCSE and aim to prepare, inspire and nurture a passion for Science, whilst laying the groundwork for further study in courses such as forensic science, nursing and physiotherapy. We do this by covering a wide range of scientific knowledge and essential practical skills. This includes preparing students to be independent analytic thinkers and scientific investigators.
Link to prior learning: The subject builds on key knowledge and skills from GCSE Sciences, whilst diving deeper into key topics such as chromatography, internal energy of particles, cell theory, waves and the electronic structure of atoms.
Rationale of sequencing: We begin the course by focusing on key skills needed during practical work. This includes the formation of risk assessments, equipment lists, formation of methods. Students are taught this alongside content during Unit 2. These topics allow students to gain understanding of the essential scientific procedures and key vocabulary required for all other coursework topics. We then move onto Unit 1 where the GCSE content for Biology, Chemistry and Physics needed in this topic is reviewed. In Biology, students then go on to learn how neurons behave during resting and action potentials, as well as the process of synaptic transmission. In Chemistry, students learn about the chemical and physical properties of many groups of elements in the periodic table. In Physics, students develop their understanding of waves by exploring diffraction gratings, standing waves and the application of optical fibres. Students then explore conditions of the musculoskeletal, lymphatic and digestive system. This is a coursework based research assignment where students will be shown case studies and research causes, symptoms and treatments of the named conditions. Throughout all topics we practice essential practical skills as well as exam skills. Topics link from one to another. We use continuous recall starters to embed content.

	Focus / Topic	Knowledge & Skills (from NC/Programmes of Study)	Assessment
Autumn 1	**Unit 2** **Assignment 2A, 2B, 2C & 2D.**	Students will learn to: 2(A) ● Investigate the concentration of unknown solutions, using procedures and techniques in titration and colorimetry ● Prepare and standardise solutions for titration and colorimetry ● Demonstrate skilful application of procedures and techniques in titration and colorimetry to accurately determine the concentration of solutions ● Evaluate the accuracy of procedures and techniques used in titration and colorimetry in relation to outcomes and suggest improvements 2(B) ● Determine the rate of cooling of substances using cooling curves ● Obtain data using different equipment to construct cooling curves ● Analyse the rate of cooling of substances from your data using cooling curves to draw conclusions ● Evaluate the accuracy of practical work in calorimetry in relation to the analysis of the cooling curve 2(C) ● Explain the use of chromatographic techniques to separate mixtures ● Use chromatographic techniques to produce chromatograms ● Analyse own chromatograms and relate the factors that affect the separation of mixtures to the quality of results obtained ● Evaluate the chromatographic techniques used in relation to outcomes and suggest improvements 2(D) ● Summarise key personal competencies developed in relation to scientific skills undertaken ● Analyse skills developed and suggest improvements to own practice ● Evaluate scientific skills developed in terms of potential for future progression	Four coursework assignments (2A, 2B, 2C, 2D). **Assignments due w/b 10th January 2022**
Autumn 2			

Spring 1 Spring 2 Summer 1	**Unit 1 Biology** **Unit 1 Chemistry** **Unit 1 Physics**	The external paper for this unit will be split into three sections. Section A – Chemistry (Structure and bonding in applications of Science, Production and uses of substances in relation to properties) Section B – Biology (Cell structure and function, Cell specialisation, Tissue structure and function) Section C – Physics (Working with waves, Waves in communication, Use of electromagnetic waves in communication) Students will cover the four assessment outcomes (AO) which will be included in their final examination. These are: AO1: Demonstrate knowledge of scientific facts, terms, definitions and scientific formulae AO2: Demonstrate understanding of scientific concepts, procedures, processes and techniques and their application AO3: Analyse, interpret and evaluate scientific information to make judgements and reach conclusions AO4: Make connections, use and integrate different scientific concepts, procedures, processes or techniques	The external paper for this unit will be split into three sections, each worth 30 marks. Biology paper = 40 mins Chemistry paper = 40 mins Physics paper = 40 mins **Mock exam near Easter.** **External Exam – June 2022**
Summer 2	**Unit 8** **Assignment A, B & C.**	Students will learn to: 8(A) ● Describe the effect of disorder of muscles and joints and possible corrective treatments ● Explain the functional role of the musculoskeletal system in the human body ● Compare how disorders of the musculoskeletal system can affect how muscles bring about movement of joints and the importance of corrective treatment ● Evaluate the effect of corrective treatment(s) associated with a musculoskeletal disorder 8(B) ● Describe the gross anatomy and function of the organs of the lymphatic system ● Describe the effect of disorder on the lymphatic system and possible corrective treatments ● Explain the physiological reasoning for corrective treatment(s) associated with the disorder of the lymphatic system ● Evaluate the effect of corrective treatment(s) for a disorder of the lymphatic system 8(C) ● Describe the symptoms of nutrient deficiency ● Carry out investigations to establish sources and importance of key nutrients for a balanced diet ● Explain the role and location of organs involved in digestion ● Explain the use of corrective treatments for nutrient deficiency ● Analyse the role of digestive enzymes on nutrient uptake in each part of the digestive system ● Evaluate the impact of nutritional deficiency and corrective treatments used, on human health	Three coursework assignments (8A, 8B, 8C). **Assignments due in Year 13 (date to be confirmed).**

Further Information: The Course Specification
All topics will be assessed with an end of module exam (every 3-4 weeks). Practical skills will be assessed throughout the course during required practical's. Students are expected to complete 5 hours of additional study per week for this course.