Access to Higher Education Unit

This unit forms part of an Access to HE Diploma. If delivering the graded version of this unit, please refer to the Provider Handbook for details on grading descriptors and the application of these across units within your programme.

Unit Title: Physics for Physiology

Graded Unit Reference Number: GA33BIO47

Ungraded Unit Reference Number: UA33BIO47

Module: Biology

Level: Three (3)

Credit Value: Three (3)

Minimum Guided Learning Hours: 30

Learning Outcome (The Learner will):	Assessment Criterion (The Learner can):
1. Understand the physics underlying the electrocardiogram (ECG) and its relationship to the cardiac cycle, including the generation and transmission of electrical signals in the heart.	1.1 Explain the role of electrical conduction in the heart and how it generates the signals recorded in an ECG.
	1.2 Describe the relationship between the phases of the cardiac cycle and the characteristic waves of the ECG (P wave, QRS complex, and T wave).
	1.3 Explain principles of bioelectricity and physics (such as voltage, resistance, and signal propagation) and how ECG electrodes detect and amplify cardiac electrical activity.
2. Understand the principles of fluid dynamics and pressure in the human body.	2.1 Explain how fluid pressure changes in the circulatory system, including the relationship between blood pressure, vessel diameter, and flow rate.
	2.2 Describe how key principles of fluid dynamics, such as resistance and viscosity, affect blood flow in arteries, veins, and capillaries.
	2.3 Apply the concepts of hydrostatic and osmotic pressure to explain the movement of fluids between blood vessels and surrounding tissues.

3.	Understand the Principles of Physics in Gas Exchange in the Human Body.	3.1	Explain how partial pressure differences drive the diffusion of oxygen and carbon dioxide in the lungs and tissues.
		3.2	With reference to Boyle's law, describe how breathing in and out changes lung size and pressure, helping air to flow into and out of the lungs.
		3.3	Explain how oxygen diffuses into the blood and how factors can affect this process (i.e. altitude or disease).