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: Nuclear Physics

Graded Unit Reference Number: GA33PHY04

Ungraded Unit Reference Number: UA33PHY04

Module: Physics

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 nuclear model of the atom	1.1 Describe Rutherford's scattering experiment and explain its significance in understanding the structure of atoms
	1.2 Explain how the results of scattering experiments can be used to an estimate of the size of the nucleus
2. Understand nuclear instability	2.1 Sketch a graph of N against Z for stable and unstable nuclei
	2.2 Use Einstein's mass energy equation to explain the binding energy of the nucleus
	2.3 Explain the decay of unstable nuclei involving γ, $\beta+$, $\beta-$, nucleon emission and electron capture
	2.4 Explain the changes in Z and A caused by different types of nuclear decay
3. Understand radioactive decay	3.1 State the exponential law of radioactive decay
	3.2 Define half-life, decay constant and activity of a radioactive material
	3.3 Solve problems involving the exponential law and radioactive decay

4.	Understand nuclear fission and nuclear fusion	4.1	Sketch a graph of binding energy per nucleon against nucleon number
		4.2	Explain nuclear fission and outline common applications of nuclear fission
		4.3	Describe nuclear fusion and explain its significance
5.	Understand the safe uses of radio isotopes	5.1	Explain the difference in the penetrating power of different the types of radiation resulting from radioactive decay
		5.2	Identify risks associated with radioactive sources and explain the safety precautions used to protect workers and others