

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: Number Systems and Data Representation

Graded Unit Reference Number: GA33MTH21

Ungraded Unit Reference Number: UA33MTH21

Module: Mathematics; Maths for Computing

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 relationships between number systems used in computing	1.1 Explain binary (base 2) representation of numbers and why electronic computer systems represent and manipulate data in binary format
	1.2 Explain octal (base 8) and hexadecimal (base 16) representation and their importance in computing
	1.3 Represent denary (base 10) numbers in pure binary, hexadecimal and binary coded decimal and convert numbers between these formats
2. Understand the different binary representations of numbers and perform calculations	2.1 Explain and use binary representations of signed integers including, one's-complement, two's-complement and base - 2
	2.2 Use binary notation to represent simple fractions, e.g. $1/2$, $3/4$, $5/8$ etc.
	2.3 Show how floating point numbers may be represented using binary notation (sign, mantissa, exponent), including the use of normalisation

	2.4	Add and subtract positive integers expressed in binary (up to 7 bits) and multiply positive integers expressed in binary (up to 4 bits.)
3. Understand the representation of alphanumeric characters using the ASCII and Unicode systems	3.1	Describe the ASCII, extended ASCII and Unicode character sets and the minimum requirements for storing characters in computer memory
	3.2	Evaluate the factors affecting the development of character representation systems, e.g. need, storage and processing overheads