Access to Higher Education Diploma (Applied Computing)

Rules of Combination

For the award of the Access to Higher education Diploma, learners must achieve 60 credits	
Level 3 credits from graded units with academic subject content	45
Level 2 or 3 credits from ungraded units	15
Total credit required	60

Mandatory requirements – graded units – 45 credits

Learners must achieve the following graded units - 30 Credits	
Units	**L3 Graded credits**
Mathematics for Computing	3
Information Systems	3
Systems Analysis and Design	3
Imperative Programming	3
Programming Paradigms	3
System Architecture	3
Network Concepts	3
IT Security	3
Investigative Project/Extended Essay	6

Learners must achieve 15 credits from following graded units	
Units	**L3 Graded credits**
Software for Controlling Systems	3
Website Development	3
3D Computer Modelling	3
Computer Animation: Uses, Techniques and Implementation	3
Application of Computer Graphics	3
Database Development	3

Mandatory requirements – ungraded units – 15 credits

	Learners must achieve the following ungraded units – 15 credits	
Units	**L3 ungraded credits**	**Level 2 credits**
Academic Skills	3	
Units from the Mathematics module	6	3
A unit from the Study Skills module		3

Other requirements
Learners must complete at least two time constrained assessments, one of which must be closed book and unseen.

Units

Computer Design

3D Computer Modelling

Level: Three
Credit Value: 3

Purpose and Aim

The unit aims to give the learner the skills and knowledge required to be able to understand how 3D models are created, also the underpinning theory and knowledge required.

Learning Outcomes The learner will	Assessment Criteria The learner can
1. Understand how 3D graphics and 3D animation are applied.	**1.1** Explain the applications of 3D modelling. **1.2** Explain geometric theory. **1.3** Explain the different aspects of displaying 3D models.
2. Be able to plan the production of 3D models.	**2.1** Interpret a client brief to produce a plan for creating 3D models. **2.2** Form ideas for a 3D project. **2.3** Assess the legal issues relating to the production of 3D models.
3. Be able to produce a set of 3D models.	**3.1** Create and edit 3D model. **3.2** Apply lighting and shadowing to 3D models and scenes. **3.3** Create and edit materials for 3D models.

Learning Outcomes The learner will	Assessment Criteria The learner can
4. Be able to review the 3D modelling project.	**3.4** Select and apply rendering options for 3D models. **4.1** Evaluate the produced 3D models against the client brief. **4.2** Analyse the strengths and weaknesses of the 3D model produced. **4.3** Describe potential improvements to the 3D model and/or process applied.

Access to HE Grade Descriptors:

- 3 - Application of Skills
- 5 - Communication and Presentation
- 7 - Quality

Achievement of this unit should only be graded if being delivered as part of an Access to HE Diploma programme of study.

Assessment Methods:

Unit Assessment Requirements are not prescribed. They remain as a **recommended** approach to assessment where they still reflect the unit specification.
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Assessment Information:

LO2 and LO3 should be completed following industry practice.
AC 2.1 The plan should include time management.
AC 2.2 The learner must use industry recognised methods.
AC 2.3 To include copyright and asset ownership.
L LO3 Create and edit at least three models comprising of at least two different shapes.

If not specifically stated in the assessment information, **a plural statement in any assessment criterion means a minimum of two**.

Assessor Requirements:

There is no information regarding specific assessor requirements for this unit. Centres should select assessors who are trained in assessment, and who have subject specific competence to assess at this level.

Computer Animation: Uses, Techniques and Implementation

Level: Three
Credit Value: 3

Purpose and Aim

The aim of this unit is to ensure learners understand types of animation and their uses and develop the knowledge and skills required to use software techniques to design and implement different types of animation.

Learning Outcomes The learner will	Assessment Criteria The learner can
1. Understand the types and use of computer animation.	**1.1** Explain a range of computer animation types. **1.2** Explain the uses of computer animation identified in AC 1.1. **1.3** Compare traditional and modern computer animation techniques. **1.4** Explain the term 'persistence of vision'.
2. Know software tools and techniques used in computer animation.	**2.1** Compare the features of software packages used in computer animation. **2.2** Explain the factors that need to be taken into account when managing file size for animations.
3. Be able to design and implement computer animations.	**3.1** Design computer animations. **3.2** Implement the animations designed in AC 3.1.
4. Be able to test and review an animation.	**4.1** Test the functionality of an animation. **4.2** Evaluate an animation.

Access to HE Grade Descriptors:

- 1 - Understanding of the Subject
- 3 - Application of Skills
- 5 - Communication and Presentation
- 7 - Quality

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Assessment Methods:

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Assessment Information:

AC 1.1 minimum of three.
AC 2.1 at least two.

AC 3.1 at least one.
AC 4.2 to include documenting issues or changes made and comparing original designs with finished animation and suggest any future improvements that could be made.

If not specifically stated in the assessment information, **a plural statement in any assessment criterion means a minimum of two**.

Assessor Requirements:

There is no information regarding specific assessor requirements for this unit. Centres should select assessors who are trained in assessment, and who have subject specific competence to assess at this level.

Application of Computer Graphics

Level: Three
Credit Value: 3

Purpose and Aim

The unit aims to give the learner the skills and knowledge required to be able to understand how graphics are used and created in major areas of the multimedia industry.

Learning Outcomes The learner will	Assessment Criteria The learner can
1. Be able to use a graphical application in a web design context.	**1.1** Explain how a graphical application is used in web design. **1.2** Design a graphical image to be used for a web site. **1.3** Create a graphical image to be used for a web site. **1.4** Review the graphical image created in AC1.3.
2. Be able to use a graphical application in the context of games design and mobile apps development.	**3.1** Explain how a graphical application is used in games and mobile app development. **2.2** Design a graphical image to be used for games design and mobile application. **2.3** Create a graphical image to be used for games and mobile apps development. **2.4** Review the graphical image created in AC3.3.
4. **3.** Understand the considerations involved in creating and use of graphics images.	**3.1** Explain considerations needed to be taken when working with graphics to include:

Learning Outcomes The learner will	Assessment Criteria The learner can
	file format size resolution colour depth transparency.

Access to HE Grade Descriptors:

- 1 - Understanding of the Subject
- 3 - Application of Skills
- 5 - Communication and Presentation
- 7 - Quality

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Assessment Methods:

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Assessment Information:

There is no specific assessment information to be used with this unit.

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Assessor Requirements:

There is no information regarding specific assessor requirements for this unit. Centres should select assessors who are trained in assessment, and who have subject specific competence to assess at this level.

Computer Systems and Network Architecture

System Architecture

Level: Three
Credit Value: 3

Purpose and Aim

The purpose and aim of the unit is to introduce learners to a range of ICT hardware, operating systems and utility software. The learner will install and configure an operating system and utility software on a desktop computer.

Learning Outcomes The learner will	Assessment Criteria The learner can
1. Understand the purpose of computer hardware components.	**1.1** Describe the purpose of hardware components in a computer system. **1.2** Describe the architecture of the central processing unit (CPU). **1.3** Explain the fetch/ decode/ execute cycle.
2. Understand the purpose of operating systems and utility software.	**2.1** Explain the features and purpose of an operating system. **2.2** Explain the purpose and uses of software utilities.
3. Be able to set up and configure a desktop computer.	**3.1** Discuss an operating system and applications to meet clients' requirements
4. Understand the features of operating systems used on mobile devices.	**4.1** Describe features required of an operating system commonly found on a mobile device. **4.2** Compare how features described in 4.1 are implemented on different operating systems designed for mobile devices.
5. Understand the environmental impact of computer systems.	**5.1** Evaluate the computer system created in 3.1 with regards to its environmental impact and the carbon footprint. **5.2** **5.2** Describe environmental hazards of inappropriate disposal of computer systems.

Access to HE Grade Descriptors:

- 1 - Understanding of the Subject
- 3 - Application of Skills
- 7 - Quality

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Assessment Methods:

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Assessment Information:

AC 1.2 must include making reference to the Arithmetic Logic Unit, Accumulator and other registers.
AC 4.1 at least three.
AC 5.1 to include focus on the hardware used.
AC 5.2 at least three hazards.

If not specifically stated in the assessment information, **a plural statement in any assessment criterion means a minimum of two**.

Assessor Requirements:

There is no information regarding specific assessor requirements for this unit. Centres should select assessors who are trained in assessment, and who have subject specific competence to assess at this level.

IT Security

Level: Three
Credit Value: 3

Purpose and Aim

The purpose and aim of the unit is to develop learners awareness of security threats to computer systems, data and methods of protecting computer systems.

Learning Outcomes The learner will	Assessment Criteria The learner can
1. Understand threats to information security.	**1.1** Assess potential non-malicious threats to computer systems. **1.2** Assess potential malicious threats to computer systems **1.3** Describe the impact of viruses on computer hardware.

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Learning Outcomes The learner will	Assessment Criteria The learner can
2. Understand methods used to protect computer systems.	**2.1** Describe the tools, techniques and methods used to protect computer systems from the threats listed in 1.1 and 2.1. **2.2** Evaluate the effectiveness of the tools, techniques and methods described in 3.1.
3. Understand how encryption and decryption of data is used.	**3.1** Describe the purpose of encryption and decryption of data. **3.2** Explain using real world examples, where encryption and decryption of data is used.

Access to HE Grade Descriptors:

- 1 - Understanding of the Subject
- 2 - Application of Knowledge
- 5 Communication and presentation
- 7 - Quality

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Assessment Methods:

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Assessment Information:

AC 1.1 at least four.
AC 1.2 at least five and this should consider the use of wireless technologies and social engineering attacks..
AC 2.2 for a given scenario.

4.1 To include symmetric and asymmetric encryption

If not specifically stated in the assessment information, **a plural statement in any assessment criterion means a minimum of two**.

Assessor Requirements:

There is no information regarding specific assessor requirements for this unit. Centres should select assessors who are trained in assessment, and who have subject specific competence to assess at this level.

Network Concepts

Level: Three
Credit Value: 3

Purpose and Aim

The purpose of the unit is to introduce some basic techniques required to network computer systems and understand different standards and protocols.

Learning Outcomes The learner will	Assessment Criteria The learner can
1. Understand Open Systems Interconnection model (OSI) and Transmission Control Protocol / Internet Protocol (IP).	**1.1** Describe each layer of the OSI model. **1.2** Describe the layers of the TCP/IP suite.
2. Understand network topologies and transmission systems.	**2.1** Explain the advantages and disadvantages of different types of network topology. **2.2** Describe the functions and features of network devices.
3. Understand network computer systems.	**3.1** Explain the differences between client server network and peer to peer. **3.2** Explain: LAN WAN. **3.3** Explain how a VPN works.
4. Understand media access control methods.	**4.1** Describe media access control (IEEE802).

Access to HE Grade Descriptors:

- 1 - Understanding of the Subject
- 2 - Application of Knowledge
- 5 Communication and Presentation
- 7 - Quality

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Assessment Methods:

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Assessment Information:

AC 2.1 This should cover at least three topologies.
AC 2.2 This should cover their applicability to both wired and wireless devices and at minimum cover at least switches and routers.

If not specifically stated in the assessment information, **a plural statement in any assessment criterion means a minimum of two**.

Assessor Requirements:

There is no information regarding specific assessor requirements for this unit. Centres should select assessors who are trained in assessment, and who have subject specific competence to assess at this level.

Applied Computing Module: Information Systems

Database Development

Level: Three
Credit Value: 3

Purpose and Aim

The purpose and aim of the unit is to develop learnerâ€™s ability to design, create and populate a relational database using appropriate tools and techniques to manipulate data.

Learning Outcomes The learner will	Assessment Criteria The learner can
1. Be able to design a relational database from a specification, using a data dictionary and a relation diagram.	**1.1** Identify entities and relationships from user requirements **1.2** Create a data dictionary **1.3** Create a relation diagram.

Learning Outcomes The learner will	Assessment Criteria The learner can
2. Be able to create a relational database using tables.	**2.1** Create database to implement a relational database using tables **2.2** Identify validation which would need to be included in an application entering data in to the database. **2.3** Apply appropriate foreign keys to the database.
3. Be able to carry out data manipulation operations	**3.1** Insert rows of data in to the database **3.2** Update data in the database. **3.3** Remove data from the database .
4. . Be able to evaluate a database against user requirements.	**4.1** Write queries to extract required information from the database.. **4.2** Evaluate the effectiveness of the database against the user requirements.

Access to HE Grade Descriptors:

- 2 – Application of Knowledge
- 3 - Application of Skills
- 4 - Use of Information
- 7 - Quality

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Assessment Methods:

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Assessment Information:

AC 1.1 at least four entities and three relationships.
AC 1.2 at least 12 attributes to be included.
AC 1.3 to show primary keys, foreign keys, entities, relationships, and multiplicity.
AC 2.2 a minimum of four different attributes should be included.
AC 2.3 At least two foreign keys must be included.
AC 3.1 At least 3 rows of data must be inserted in to each table.
AC 3.2 At least two update statements. One of these must use a conditional statement.
AC 3.3 At least two delete statements. One of these must use a conditional statement.
AC 4.1 At least five queries. Two of these must be multi-table queries, one of which must use a join technique.

If not specifically stated in the assessment information, **a plural statement in any assessment criterion means a minimum of two**.

Assessor Requirements:

There is no information regarding specific assessor requirements for this unit. Centres should select assessors who are trained in assessment, and who have subject specific competence to assess at this level.

Application and Usage of Information

Level: Three
Credit Value: 3

Purpose and Aim

The purpose of the unit is to develop the learner's ability to understand how businesses use information, comprehend the features and functions of information systems and use IT tools to produce reports for management.

Learning Outcomes The learner will	Assessment Criteria The learner can
1. Understand the role of data, information and knowledge in organisations.	**1.1** Explain the difference between data, information and knowledge. **1.2** Describe the process required to transform data into knowledge. **1.3** Describe how businesses use data.
2. Understand the tools used to transform data into knowledge.	**2.1** Describe the tools used to transform data into knowledge. **2.2** Analyse data using appropriate tools. **2.3** Compare the advantages and disadvantages of open source and proprietary tools.
3. Understand the legal and ethical issues of data collection, processing, storage and transfer.	**3.1** Describe the impact of key legislation in relation to collection processing, storage and transfer of data. **3.2** Describe ethical issues relating to data collection, processing storage or transfer of data, information or knowledge.
4. Understand the concepts, requirements and applications of big data.	**4.1** Describe the meaning of the term "big data".

Learning Outcomes The learner will	Assessment Criteria The learner can
	4.2 Describe the benefits and drawbacks of big data. **4.3** Describe the organisational application of big data. **4.4** Explain the limitations of existing relational database technologies for processing big data. **4.5** Describe the benefit of distributed processing and storage of big data.

Access to HE Grade Descriptors:

- 1 Understanding of the subject
- 5 - Communication and Presentation
- 7 - Quality

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Assessment Methods:

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Assessment Information:

AC 1.3 this should include at least three functional areas.
AC 2.1 to include:

- Expert systems
- Machine learning
- Relational database management systems
- Spreadsheets.

AC 2.2 in reference to a case study.
AC 3.1 to include:

- Freedom of Information Act
- General Data Protection Regulation (GDPR)
- Regulation of investigatory powers act.

If not specifically stated in the assessment information, **a plural statement in any assessment criterion means a minimum of two**.

Assessor Requirements:

There is no information regarding specific assessor requirements for this unit. Centres should select assessors who are trained in assessment, and who have subject specific competence to assess at this level.

Mathematics for Computing

Mathematics for Computing

Level: Three
Credit Value: 3

Purpose and Aim

The aim of the unit is to introduce learners to underlying mathematical concepts that are important in the field of computing.

Learning Outcomes The learner will	Assessment Criteria The learner can
1. Be able to use number bases.	**1.1** Explain the concept of place value for different number bases. **1.2** Convert between number bases. **1.3** Perform arithmetic calculations in different number bases.
2. Be able to apply the theory of sets to problem solving.	**2.1** Demonstrate the use of set notation to describe sets. **2.2** Explain the concepts of: set elements subsets supersets the empty set the universal set power sets set cardinality. **2.3** Perform calculations using set operators.
3. Be able to manipulate expressions over the Boolean algebra.	**3.1** Evaluate Boolean expressions involving the operators: AND OR NOT XOR NAND NOR.

Learning Outcomes The learner will	Assessment Criteria The learner can
4. Be able to perform calculations on matrices.	**3.2** Illustrate Boolean expressions using truth tables and logical simulations. **3.3** Prove the logical equivalence of Boolean expressions using truth tables. **4.1** Perform calculations using matrix operations to include: addition subtraction scalar multiplication matrix multiplication transpose With square and rectangular matrices of order 2x3 or higher. **4.2** Perform the calculations listed in 4.1 with matrices of a range of orders from order 4x4 and above.

Access to HE Grade Descriptors:

- 2 - Application of Knowledge
- 3 - Application of Skills
- 7 - Quality

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Assessment Methods:

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Assessment Information:

AC 1.1 to include fractional positions.
AC 1.2 to include decimal, octal, hexadecimal, binary number bases.
AC 2.1 must use descriptors, lists, predicates and membership symbol.
AC 2.3 to include Union, Intersection and Complement.
AC 3.3 must involve multiple operators and brackets.
AC 4.2 to be performed by using a computer algebra system.

If not specifically stated in the assessment information, **a plural statement in any assessment criterion means a minimum of two**.

Software Development

Imperative Programming

Level: Three
Credit Value: 3

Purpose and Aim

The aim of the unit is to provide learners with practical programming skills in a common imperative language.

Learning Outcomes The learner will	Assessment Criteria The learner can
1. Be able to declare and assign values to variables and constants.	**1.1** Explain the uses of the basic data types as defined by the chosen language. **1.2** Declare and assign values to variables and constants. **1.3** Explain the concept of variables' scope.
2. Be able to utilize programming structures to create software.	**2.1** Produce programming that demonstrates: • simple sequences of input • output assignment • function call statements. **2.2** Produce programming that demonstrates selection, of: if else if dictionaries. **2.3** Produce programming to demonstrate iteration, to include: determinate indeterminate loops. **2.4** Produce programming examples to demonstrate the use of nested constructs.
3. Be able to define and use functions.	**3.1** Produce programming examples using functions with input parameters and appropriate return types.

Learning Outcomes The learner will	Assessment Criteria The learner can
4. Be able to utlise programming structure to create and manipulate data structures	**3.2** Demonstrate the use of calling a function. **3.3** Demonstrate the use of a recursive function. **4.1** Produce programming to demonstrate creation of simple data structures **4.2** Produce programming to demonstrate manipulation of simple data structures.

Access to HE Grade Descriptors:

- 2 - Application of Knowledge
- 3 - Application of Skills
- 5- Communication and Presentation
- 7 - Quality

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Assessment Methods:

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Assessment Information:

AC1.1 the assessment should cover representations of Boolean, integer, floating point, character and string data types.
AC1.2 the assessment should cover at least one of each type listed in 1.1.

If not specifically stated in the assessment information, **a plural statement in any assessment criterion means a minimum of two**.

Assessor Requirements:

There is no information regarding specific assessor requirements for this unit. Centres should select assessors who are trained in assessment, and who have subject specific competence to assess at this level.

Programming Paradigms

Level: Three
Credit Value: 3

Purpose and Aim

The aim of the unit is to provide learners with an understanding of programming paradigms and their areas of application.

Learning Outcomes The learner will	Assessment Criteria The learner can
1. Understand the use of software development methodologies.	**1.1** Explain the stages of a software development life cycle. **1.2** Compare different software design methodologies. **1.3** Interpret software blue-prints.
2. Be able to explain the concepts of high level programming.	**2.1** Explain high and low level languages. **2.2** Explain the meaning of: lexical analysis syntactic analysis semantic analysis. **2.3** Describe the key features of compiler and interpreter based language technologies. **2.4** Demonstrate the stages of compilation of a high level program.
3. Be able to apply programming paradigms for software development.	**3.1** Describe the following programming paradigms: procedural event-driven object-orientated functional logic based scripting. **3.2** Identify a range of applications where the programming paradigms listed in 3.1 could be applied. **3.3** Develop a basic programming example for a programming paradigm listed in 3.1.

Access to HE Grade Descriptors:

- 1 - Understanding of the Subject
- 2 - Application of Knowledge
- 5 - Communication and Presentation

- 7 - Quality

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Assessment Methods:

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Assessment Information:

AC1.3 to include such as DFD's, structured charts and inheritance diagrams.
AC2.1 to include examples of where they would be used.
AC2.3 minimum of three for each compiler and interpreter.
AC3.1 to include the identification of suitable languages to support each.

AC3.3 Two programming paradigms listed in 3.1

If not specifically stated in the assessment information, **a plural statement in any assessment criterion means a minimum of two**.

Assessor Requirements:

There is no information regarding specific assessor requirements for this unit. Centres should select assessors who are trained in assessment, and who have subject specific competence to assess at this level.

Software for Controlling Systems

Level: Three
Credit Value: 3

Purpose and Aim

The aim of the unit is to provide learners with underpinning knowledge required for and practical experience of controlling systems using software.

Learning Outcomes The learner will	Assessment Criteria The learner can
1. Understand the applications of software controlled systems.	**1.1** Explain the different categories of software control systems. **1.2** Explain the application of the software control systems identified in AC 1.1.
2. Understand the hardware requirements for software to run on embedded and autonomous systems.	**2.1** Describe the key technologies used in embedded and autonomous systems. **2.2** Describe a range of small computer systems suitable for implementing control systems.
3. Understand the application of sensors, outputs and actuators for control systems.	**3.1** Compare and contrast digital and analogue signals. **3.2** Describe a range of sensors and outputs commonly used in control systems. **3.3** Produce software for the control of sensors and actuators.
4. Be able to create and evaluate a closed loop control system.	**4.1** Explain the use of open and closed control loops. **4.2** Create a control system using control loops. **4.3** Evaluate the functionality and performance of the system created in 4.2.

Access to HE Grade Descriptors:

- 2 - Application of Knowledge
- 3 - Application of Skills
- 7 - Quality

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Assessment Methods:

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Assessment Information:

AC1.1 a minimum of four.
AC2.1 to include at least:

- Micro controller architecture
- Memory mapped input and output
- Power supply.

AC2.2 at least three.
AC3.2 at least three of each.

If not specifically stated in the assessment information, **a plural statement in any assessment criterion means a minimum of two**.

Assessor Requirements:

There is no information regarding specific assessor requirements for this unit. Centres should select assessors who are trained in assessment, and who have subject specific competence to assess at this level.

Website Development

Website Development

Level: Three
Credit Value: 3

Purpose and Aim

The unit aims to give the learner the skills and knowledge required to be able to create web pages, under pinning the theory and knowledge required.

Learning Outcomes The learner will	Assessment Criteria The learner can
1. Be able to plan a website.	**1.1** Plan content for a website. **1.2** Use tools and techniques to communicate the proposed content, design and layout of the website. **1.3** Design the layout of the website.
2. Be able to create, edit and combine assets for use in a website.	**2.1** Gather assets to be used in relation to the website layout. **2.2** Assess how copyright and other constraints affect the assets to be used for the proposed website. **2.3** Use software to create and optimise assets.
3. Be able to create web pages.	**3.1** Use software to create web pages. **3.2** Combine information from sources into web pages.

Learning Outcomes The learner will	Assessment Criteria The learner can
	3.3 Explain the use of different file formats and compression used in website creation.
4. Be able to use web authoring software.	**4.1** Use web authoring software to edit and format website content.
5. Be able to test and evaluate website effectiveness.	**5.1** Create and implement a test plan to check website performance and functionality. **5.2** Evaluate the completed website against the client specification.

Access to HE Grade Descriptors:

- 1 - Understanding of the Subject
- 3 - Application of Skills
- 5 - Communication and Presentation
- 7 - Quality

Achievement of this unit should only be graded if being delivered as part of an Access to HE Diploma programme of study.

Assessment Methods:

Unit Assessment Requirements are not prescribed. They remain as a **recommended** approach to assessment where they still reflect the unit specification.
From September 2021, centre devised assessments are permitted for all units on all Agored Cymru Access to HE Diplomas.
All assessment evidence completed as part of an Agored Cymru Access To HE Diploma Is subject To external moderation.

Assessment Information:

AC 1.1 as defined by the client brief.
AC 1.2 This should include interface designs and navigation diagrams.
AC1.3 including appropriate graphics and animation.
AC 3.1 minimum of five using design techniques e.g. cascade style sheets.
AC 3.2 At least one each of text, images and multimedia.
AC 5.1 to include different output media and software platforms.
AC 5.2 to include identifying improvements.

If not specifically stated in the assessment information, **a plural statement in any assessment criterion means a minimum of two**.

Assessor Requirements:

There is no information regarding specific assessor requirements for this unit. Centres should select assessors who are trained in assessment, and who have subject specific competence to assess at this level.

Investigative Project / Extended Essay

Access to HE Investigative Project / Extended Essay

Level: Three
Credit Value: 6

Learning Outcomes The learner will	Assessment Criteria The learner can
1. Be able to plan and propose an investigative project/extended essay.	**1.1** Identify an area for research. **1.2** Produce a **research proposal** for an investigative project/extended essay.
2. Be able to conduct research.	**2.1** Conduct research for an investigative project/extended essay. **2.2** Evaluate established resources that address the research topic.
3. Be able to produce an investigative project/extended essay.	**3.1** Analyse findings of completed research. **3.2** Present the research as an investigative project/extended essay.

Access to HE Grade Descriptors:

- 1 - Understanding of the Subject
- 2 - Application of Knowledge
- 4 - Use of Information
- 5 - Communication and Presentation
- 6 - Autonomy / Independence
- 7 - Quality

Achievement of this unit should only be graded if being delivered as part of an Access to HE Diploma programme of study.

Assessment Methods:

Unit Assessment Requirements are not prescribed. They remain as a **recommended** approach to assessment where they still reflect the unit specification.

From September 2021, centre devised assessments are permitted for all units on all

Agored Cymru Access to HE Diplomas.
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Unit assessment requirements are no longer prescriptive. They are recommended assessment plans. Centres can devise their own assessment plan for this unit.
Assessment Information:

Investigative project/extended essay in this unit is defined as a written account of a piece of research, contextualised by the Access to HE Diploma title, of up to 3000 words.

AC1.2 **Research proposal.** This must include a research question to answer, a rationale, the selection of appropriate forms of research, identifying established secondary resources, collating findings, time scales and analytical methods to be used (500-800 words).

AC2.1 **Conduct research.** The forms of research and analytical methodologies selected must be fit for purpose for the area of study. These may include exploratory research, constructive research, empirical research, quantitative research, qualitative research, intersubjectivity, evidence-based research. the investigative project/extended essay must be based on secondary research only.

Evidence generated for this unit cannot be used as evidence for any part of the unit 'Academic Skills'.

If not specifically stated in the assessment information, **a plural statement in any assessment criterion means a minimum of two**.

Assessor Requirements:

There is no information regarding specific assessor requirements for this unit. Centres should select assessors who are trained in assessment, and who have subject specific competence to assess at this level.

Mathematics L2 ungraded

Data Handling and Probability

Level:	Two
Credit Value:	3

Purpose and Aim

To give the learners knowledge and skills required in data handling and probability

Learning Outcomes The learner will	**Assessment Criteria** The learner can
1. Know suitability of questions for a data collection questionnaire.	**1.1** Design questions for a data collection questionnaire. **1.2** Assess the suitability of questions for a specified data collection questionnaire.
2. Be able to organise statistical data.	**2.1** Organise data into 2-way tables. **2.2** Group data into class intervals of equal width.
3. Be able to present statistical data.	**3.1** Present statistical data using: bar charts line graphs pie charts scatter graphs frequency polygons frequency diagrams. **3.2** Interpret graphs and charts.
4. Be able to calculate average and range.	**4.1** Calculate mean, median mode and range of discrete data. **4.2** Estimate the mean of grouped data using mid interval value. **4.3** Compare the mean and range of sets of data.
5. Be able to express the probability of events occurring.	**5.1** List the outcomes of combined events occurring. **5.2** Express probabilities in words and numerically. **5.3** Calculate a missing probability from a set of values. **5.4** Predict the number of times an outcome will occur in a given number of trials.

Assessment Methods:

There are no prescribed assessment methods for this unit. Assessments used should be fit for purpose for the unit and learners, and generate evidence of achievement for all the assessment criteria.

Assessment Information:

There is no specific assessment information to be used with this unit.

If not specifically stated in the assessment information, **a plural statement in any assessment criterion means a minimum of two**.

Other Mappings:

AC1.1 A minimum of four questions. The purpose of the questionnaire should be stated and the question designed to collect relevant data.
AC1.2 A minimum of four questions.
AC2.1 The data set should have a minimum size of 20.
AC2.2 The data set should have a minimum size of 20.
AC3.1 A minimum of one of each type required, created digitally. Scales and axis must be chosen by the learner on at least two occasions. Data could be provided appropriate to the data and purpose. .
AC3.2 A minimum of two.
AC4.1 The data set should have a minimum size of 20.
AC4.2 The data set should have a minimum size of 20.
AC4.3 Up to two pairs of sets of data should be compared.
AC5.1 For example by using a sample space diagram.
AC5.2 A minimum of five probabilities. Numerically could include using decimals, percentages or fractions.
AC5.3 Using the principle 1-P as the probability of an event not occurring.
AC5.4 Diagrammatic representations could be used to facilitate the prediction.

Shape, Space and Measure

Level: Two
Credit Value: 3

Purpose and Aim

To give the learners knowledge and skills required in shape, space and measure.

Learning Outcomes The learner will	Assessment Criteria The learner can
1. Be able to work within and between systems of units.	**1.1** Convert between units of measure within the metric system. **1.2** Convert between metric and imperial measures. **1.3** Select units for estimating or carrying out measurement.
2. Be able to calculate perimeter, area, volume and surface area of shapes and solids.	**2.1** Calculate perimeter and area of a 2D shape. **2.2** Calculate surface area and volume of a 3D shape.
3. Be able to describe and use the symmetry properties of 2D shapes.	**3.1** Demonstrate the symmetry properties of polygons. **3.2** Use order of rotational symmetry to determine 2D shape **3.3** Transform a shape by reflection, rotation, translation or enlargement.
4. Be able to calculate and use angle properties.	**4.1** Calculate angles using the properties of:- triangles quadrilaterals intersecting lines parallel lines. **4.2** Calculate interior and exterior angles of regular polygons. **4.3** Use Pythagoras' theorem to find a missing side of a right angled triangle.
5. Be able to use the principles of loci in constructions.	**5.1** Find and describe regions satisfying a combination of loci.
6. Be able to use bearings.	**6.1** Indicate the position of an object by using its bearings. **6.2** Use bearings to specify direction.

Assessment Methods:

There are no prescribed assessment methods for this unit. Assessments used should be fit for purpose for the unit and learners, and generate evidence of achievement for all the assessment criteria.

Assessment Information:

AC1.1 A minimum of four units of measure.
AC1.2 A minimum of three measures.
AC2.1 A minimum of three shapes to include circles and compound shapes.
AC2.2 A minimum of four shapes to include prisms, cylinders, cubes and cuboids.
AC3.1 A minimum of three polygons.
AC3.3 A minimum of two different shapes. Each type of transformation should be carried out at least once but not all need to be used on every shape. Translations should include the use of vectors. Enlargements should use the centre of enlargement.

If not specifically stated in the assessment information, **a plural statement in any assessment criterion means a minimum of two**.

Number

Level: Two
Credit Value: 3

Purpose and Aim

To give the learners knowledge and skills required in number

Learning Outcomes The learner will	**Assessment Criteria** The learner can
1. Be able to calculate using decimals, fractions and percentages.	**1.1** Add, subtract, multiply and divide decimals. **1.2** Add, subtract, multiply and divide fractions. **1.3** Use percentages to solve problems.
2. Understand fractions, decimals and percentages.	**2.1** Convert between fractions, decimals and percentages. **2.2** Order fractions, decimals and percentages.
3. Understand ratios and proportions.	**3.1** Write ratios in their simplest form.

Learning Outcomes The learner will	Assessment Criteria The learner can
	3.2 Divide a quantity in a given ratio. **3.3** Use proportions to solve problems. **3.4** Use ratios to interpret diagrams drawn to scale.
4. Know different types of number.	**4.1** Identify prime, square, triangular, cube numbers, multiples and factors from a set of values. **4.2** Find the lowest common multiple and highest common factor of 2 numbers. **4.3** Find the product of prime factors of whole numbers.
5. Be able to approximate values.	**5.1** Approximate numbers to a given number of significant figures or decimal places.
6. Be able to perform calculations with and without the use of a calculator.	**6.1** Use a calculator for compound calculations. **6.2** Use estimation to check answers to calculations. **6.3** Choose the degree of accuracy appropriate for a particular purpose.
7. Be able to solve problems requiring calculations with negative numbers.	**7.1** Use calculations involving negative numbers to solve problems.

Assessment Methods:

There are no prescribed assessment methods for this unit. Assessments used should be fit for purpose for the unit and learners, and generate evidence of achievement for all the assessment criteria.

Assessment Information:

AC1.1 Numbers of up to two decimal places should be included. For multiplication and division, only one of the values needs to be a decimal number. The calculations should include practical problems.
AC1.3 A minimum of three problems. These should also include finding a percentage of a quantity in order to increase or decrease in real life situations, for example in calculations of:

- VAT
- value of profit or loss
- simple interest.

AC3.1 A minimum of four ratios.
AC3.2 Examples should include contexts, for example: recipes, best buys.
AC3.3 A minimum of three problems.
AC3.4 A minimum of two diagrams. These could be scale drawings or maps.
AC5.1 A minimum of four numbers.
AC6.1-6.3 On a minimum of four occasions.
AC7.1 A minimum of two multistaged problems of a complexity appropriate to the level of the unit.
If not specifically stated in the assessment information, **a plural statement in any assessment criterion means a minimum of two**.

Mathematics – level 3 ungraded

Algebra and Graphs for Computing

Level: Two
Credit Value: 3

Purpose and Aim

To give learners knowledge and skills required in algebra and graphs for Computing.

Learning Outcomes The learner will	**Assessment Criteria** The learner can
1. Be able to apply the laws of precedence.	**1.1** Use brackets and the hierarchy of operations in calculations.
2. Be able to use rules of indices to simplify expressions.	**2.1** Use index laws to simplify numerical and algebraic expressions. **2.2** Perform calculations using indices.
3. Be able to solve problems using formulae.	**3.1** Describe given situations using algebraic formulae. **3.2** Apply formulae to make calculations.
4. Be able to perform basic operations on simple algebraic expressions and inequalities.	**4.1** Manipulate algebraic expressions by expanding brackets and collecting like terms.

Learning Outcomes The learner will	Assessment Criteria The learner can
	4.2 Factorise algebraic expressions by extracting common factors. **4.3** Solve linear equations. **4.4** Solve linear inequalities. **4.5** Change the subject of formulae.
5. Be able to calculate missing sides and angles of triangles	5.1 Use Pythagoras to find missing sides in right angle triangles. 5.2 Use the three trig ratios sign cos and tan to calculate missing sides and angles in right angle triangles.
6. Be able to interpret and plot graphs. **7.** Be able to interpret and plot non linier graphs	**6.1** Plot Cartesian coordinates in all four quadrants. **6.2** Identify coordinates of given points. **6.3** Plot and draw straight line graphs. **6.4** Find the coordinates of the midpoint of a line segment. **7.1** Plot Quadratic graphs **7.2** Plot Cubic graphs **7.3** Plot exponential graphs

Assessment Methods:

There are no prescribed assessment methods for this unit. Assessments used should be fit for purpose for the unit and learners, and generate evidence of achievement for all the assessment criteria.

Assessment Information:

AC1.1 A minimum of five calculations.
AC2.1 A minimum of five expressions.
AC2.2 A minimum of five calculations.
AC3.1 A minimum of three situations.
AC4.1-4.5 A minimum of five of each.
AC4.1 The expressions should be up to and including the form ax (bx ±c).
AC4.2 The expressions should include letters and numbers and be up to and including the form $ax^2 \pm bx$.

AC4.3 On at least one occasion, an unknown is required on both sides of the equation. At least one of the equations should include brackets. At least one of the equations should include a negative solution.
AC5.1 A minimum of two..
AC6.1-6.3 A minimum of three of each.
AC6.3 Graphs should include:

- those in the form of y=mx+C

If not specifically stated in the assessment information, **a plural statement in any assessment criterion means a minimum of two**.

Assessor Requirements:

There is no information regarding specific assessor requirements for this unit. Centres should select assessors who are trained in assessment, and who have subject specific competence to assess at this level.

Pure Mathematics – Equations, Geometry, Trigonometry and Calculus

Level: Three
Credit Value: 3

Purpose and Aim

To enable the learner to understand how to manipulate algebra and solve equations, to use coordinate geometry, to solve problems using trigonometry, and to use basic calculus.

Learning Outcomes The learner will	Assessment Criteria The learner can
1. Be able to manipulate algebra and solve equations. (N3.2)	**1.1** Manipulate algebraic expression. **1.2** Solve linear, quadratic and simultaneous equations.

Learning Outcomes The learner will	Assessment Criteria The learner can
2. Understand how to use co-ordinate geometry. (N.3, N4.2)	**2.1** Calculate gradients of a line, including parallel and perpendicular lines. **2.2** Find equations of straight lines. **2.3** Calculate the distance between two points. **2.4** Find the midpoint of a line.
3. Be able to solve problems using trigonometry. (N3.2)	**3.1** Find sine, cosine and tangent of any angle. **3.2** Apply trigonometry to right-angled triangles. **3.3** Use sine and cosine rules to solve problems.
4. Understand how to use basic calculus. (N3.2, N4.2)	**4.1** Perform basic differentiation. **4.2** Apply calculus to gradients, tangents and normals. **4.3** Calculate maxima and minima. **4.4** Calculate definitive integrals and areas. **4.5** Use the trapezium rule.

Assessment Methods:

Unit Assessment Requirements are not prescribed. They remain as a **recommended** approach to assessment where they still reflect the unit specification.
From September 2021, centre devised assessments are permitted for all units on all Agored Cymru Access to HE Diplomas.
All assessment evidence completed As part Of an Agored Cymru Access To HE Diploma Is subject To external moderation.

Assessment Information:

There is no specific assessment information to be used with this unit.

If not specifically stated in the assessment information, **a plural statement in any assessment criterion means a minimum of two**.

Assessor Requirements:

There is no information regarding specific assessor requirements for this unit. Centres should select assessors who are trained in assessment, and who have subject specific competence to assess at this level.

Academic Skills

Academic Skills

Level: Three
Credit Value: 3

Purpose and Aim

To provide opportunities for learners to demonstrate the academic skills needed to complete assessments on Access to Higher Education Diplomas.

Learning Outcomes The learner will	**Assessment Criteria** The learner can
1. Be able to plan and complete a written academic assessment.	**1.1** Plan a written academic assessment showing logical structure. **1.2** Make use of source material. **1.3** Produce a written academic assessment.
2. Be able to plan and deliver an academic presentation.	**2.1** Plan an academic presentation with a logical structure for an intended audience. **2.2** Summarise information from a range of sources. **2.3** Deliver an academic presentation using a range of techniques.
3. Be able to participate in an academic discussion.	**3.1** Prepare to participate in an academic discussion. **3.2** Participate in an academic discussion. **3.3** Produce a summary of an academic discussion.
4. Be able to take notes.	**4.1** Produce notes from a variety of sources.
5. Be able to reference source material.	**5.1** Apply referencing in line with established academic conventions to indicate the use of sources.

Assessment Methods:

Unit assessment requirements are no longer prescriptive. They are recommended assessment plans. Centres can devise their own assessment plan for this unit.
Assessment Information:

AC1.2 Can include digital and non-digital source material.
AC1.3 The **written academic assessment** may be an essay or a report and must be produced for a graded unit with academic subject content.
AC2.1 The **intended audience** must comprise of two people including the assessor.
AC2.3 **Presentation techniques** can be variable and may include digital resources. Learners may deliver a presentation based on an academic poster that they have produced. Delivery can be either face to face or online. Online presentations can be either delivered synchronously or asynchronously. The presentation must be approximately 15 minutes in length.
AC4.1 Sources may include lectures, presentations and written texts.

Evidence generated for the unit Access to HE Investigative Project / Extended Essay cannot be used for evidence for this unit.

If not specifically stated in the assessment information, **a plural statement in any assessment criterion means a minimum of two**.

Assessor Requirements:

There is no information regarding specific assessor requirements for this unit. Centres should select assessors who are trained in assessment, and who have subject specific competence to assess at this level.

Study Skills

Thinking Skills

Level: Three
Credit Value: 3

Purpose and Aim
This unit provides learning opportunities for developing thinking skills and embedding these skills across a range of tasks and learning.

Learning Outcomes The learner will	Assessment Criteria The learner can
1. Understand methods of improving thinking skills.	**1.1** Describe **methods** of developing thinking skills. **1.2** Evaluate a method of developing thinking skills.
2. Be able to apply a range of thinking skills.	**2.1** Evaluate own thinking skills used in assessments. **2.2** Create a reflective portfolio.
3. Understand their development in the context of thinking skills.	**3.1** Evaluate their progress in terms of reflective practice and thinking skills.

Assessment Methods:

There are no prescribed assessment methods for this unit. Assessments used should be fit for purpose for the unit and learners, and generate evidence of achievement for all the assessment criteria.

Assessment Information:

AC1.1 A minimum of two methods.
AC2.1 A minimum of two assessments completed for units with academic subject content.

If not specifically stated in the assessment information, **a plural statement in any assessment criterion means a minimum of two**.

Planning and Time Management

Level: Three
Credit Value: 3

Purpose and Aim

This unit provides opportunities for the learner to plan, prepare and set targets as part of an overall time management strategy for study.

Learning Outcomes The learner will	Assessment Criteria The learner can
1. Understand personal planning needs and time management issues.	**1.1** Evaluate their own time management skills in relation to study. **1.2** Develop a weekly study timetable. **1.3** Identify the **problems and solutions** to the implementation of the timetable **1.4** Meet deadlines when submitting assessed work.
2. Be able to plan a programme of study. **2.** Be able to assess programme/timetables to achieve goals.	**2.1** Review their study plans to establish potential revisions to timetables.

Assessment Methods:

Unit assessment requirements are no longer prescriptive. They are recommended assessment plans. Centres can devise their own assessment plan for this unit.
Assessment Information:

AC1.2 To consider workload, time available and possible unforeseen circumstances.
AC1.3 A minimum of two **potential problems and solutions**.
AC1.4 Across all formal assessments.

If not specifically stated in the assessment information, **a plural statement in any assessment criterion means a minimum of two**.

Assessor Requirements:

There is no information regarding specific assessor requirements for this unit. Centres should select assessors who are trained in assessment, and who have subject specific competence to assess at this level.

Revision and Exam Skills

Level: Three
Credit Value: 3

Purpose and Aim

The unit will provide the learner with opportunities to develop their examination and revision techniques and overall planning.

Learning Outcomes The learner will	Assessment Criteria The learner can
1. Be able to prepare for an examination.	**1.1** Analyse their strengths and weaknesses in relation to examination strategies. **1.2** Develop detailed personal revision strategies/plans to prepare for an examination.
2. Be able to respond to the requirements of an examination.	**2.1** Produce evidence of planning activities undertaken as part of the examination process. **2.2** Produce relevant, structured and substantial answers to the questions set within the time allowed. **2.3** Communicate answers clearly, concisely and accurately in a required format using necessary conventions.
3. Be able to evaluate revision and examination performance.	**3.1** Evaluate own revision schedule. **3.2** Evaluate own stress management skills. **3.3** Evaluate own strengths and weaknesses in exams.

Assessment Methods:

Unit assessment requirements are no longer prescriptive. They are recommended assessment plans. Centres can devise their own assessment plan for this unit.

Assessment Information:

AC2.1: For example, mind-mapping, rough plans.

If not specifically stated in the assessment information, **a plural statement in any assessment criterion means a minimum of two**.

Assessor Requirements:

There is no information regarding specific assessor requirements for this unit. Centres should select assessors who are trained in assessment, and who have subject specific competence to assess at this level.

Academic Writing

Level: Three
Credit Value: 3

Purpose and Aim

To enable the learner to understand how to:

- use punctuation and grammar in writing
- prepare for a piece of extended writing
- bring together ideas and information from different sources
- produce a piece of extended writing.

Learning Outcomes The learner will	Assessment Criteria The learner can
1. Understand the correct use of punctuation and grammar in writing.	**1.1** Explain the purpose of the following punctuation marks: colon semicolon hyphen apostrophe. **1.2** Give examples of the use of the marks in 1.1 within own writing. **1.3** Explain the use of coordinating and subordinating conjunctions.

Learning Outcomes The learner will	Assessment Criteria The learner can
	1.4 Explain how to punctuate quoted statements within a piece of writing.
	1.5 Explain the following grammatical errors: comma splice pleonasm run on sentences.
	1.6 Explain the key features of a well-structured paragraph.
2. Understand how to prepare for a piece of extended writing.	**2.1** Identify the purpose and audience for a piece of extended writing.
	2.2 Describe key features of the genre to be used.
3. Know how to bring together ideas and information from different sources.	**3.1** Define the term plagiarism.
	3.2 Make notes from reading on the selected topic.
	3.3 Record references to reading accessed.
4. Be able to produce a piece of extended writing.	**4.1** Produce a piece of extended writing which demonstrates the correct use of grammar and punctuation.

Assessment Methods:

There are no prescribed assessment methods for this unit. Assessments used should be fit for purpose for the unit and learners, and generate evidence of achievement for all the assessment criteria.

Assessment Information:

AC1.1 The possessive and omission use of the apostrophe must be explained.
AC1.2 A minimum of two examples of each.

If not specifically stated in the assessment information, **a plural statement in any assessment criterion means a minimum of two**.

Assessor Requirements:

There is no information regarding specific assessor requirements for this unit. Centres should select assessors who are trained in assessment, and who have subject specific competence to assess at this level.

Digital Information Literacy (new unit)

Level: **Three**
Credit Value: **3**

Purpose and Aim: To understand how search history is used by third parties. To use and evaluate the digital information to complete complex tasks.

LEARNING OUTCOMES	ASSESSMENT CRITERIA
The learner will	The learner can
1. Understand techniques used to gather and evaluate digital information.	**1.1** Explain how search results may be manipulated by a variety of processes. **1.2** Explain techniques used by third parties to gather information about website users. **1.3** Explain the advantages and limitations of digital information. **1.4** Explain ways to evaluate digital information.
2. Be able to search for, evaluate and use digital information to complete a complex task.	**2.1** Plan a complex task requiring the application of digital information. **2.2** Use advanced search techniques to obtain the required information. **2.3** Justify his/her choice of search engine. **2.4** Evaluate the results of the searches in 3.2. **2.5** Organise, classify and save the information in a structured format so that it can be applied to the task in 3.1.
3. Be able to use and review digital information to complete a task.	**3.1** Use digital information found in 2.4 to complete the complex task stated in 2.1.

	3.2 Evaluate the appropriateness of the information obtained for the stated task.

NOS:
Other Mappings:
Assessment Methods:
Assessment Evidence:
Assessment Information: 2.1 The task should be of a complexity appropriate to the level of the unit and require the application of at least three different items of digital information. For example: Research for an assignment or enterprise project, research for presentations, research to provide advice and guidance.
Assessor Requirements: There is no information regarding specific assessor requirements for this unit. Centres should select assessors who are trained in assessment, and who have subject specific competence to assess at this level.
Prerequisites: There is no information regarding specific assessor requirements for this unit. Centres should select assessors who are trained in assessment, and who have subject specific competence to assess at this level.

Professional Behaviours (new unit)

Level: Three
Credit Value: 3

Purpose and Aim

To provide opportunities for learners to Identify the professional behaviours relevant to a professional setting

Learning Outcomes The learner will	Assessment Criteria The learner can
1. Understand the characteristics required to work in a professional setting.	**1.1** Analyse the characteristics required to work in a professional setting with reference to associated principles and concepts of professionalism.
2. Understand effective communication and team working skills.	**2.1** Distinguish between effective and ineffective skills with reference to a relevant model for each of the following: communication teamwork. **2.2** Evaluate the effectiveness of own communication skills, with reference to: verbal skills non-verbal skills. **2.3** Evaluate own team working skills.
3. Know how to manage risk and deal effectively with problems.	**3.1** Summarise the principles of risk management and problem-solving. **3.2** Explain how to solve a problem and manage any associated risk, using an actual or hypothetical problem relevant to a professional setting.
4. Reflect on own skills and develop a personal and professional development plan.	**4.1** Evaluate their own skills against those expected in a professional setting using a chosen model of reflective practice. **4.2** Identify own development needs based on evaluations in 4.1. **4.3** Produce a plan to meet personal and professional development objectives based on an evaluation of different options. **4.4** Reflect on own performance against the plan, identifying learning needs for the future throughout the duration of the Access to HE Diploma.

Assessment Methods:

It is recommended that this unit is assessed by way of a reflective learning journal in part or in its entirety.

Assessment Information:

AC1.1 Learners to identify a professional setting associated with their intended progression route

AC4.1 Learners must evaluate the skills they have developed through their particular life experiences. This may include work (paid or voluntary), education, travel, family commitments.

If not specifically stated in the assessment information, **a plural statement in any assessment criterion means a minimum of two**.

Assessor Requirements:

There is no information regarding specific assessor requirements for this unit. Centres should select assessors who are trained in assessment, and who have subject specific competence to assess at this level.