

# DIPLOMA GUIDE



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## Access to HE Diploma (Engineering Science and Mathematics)

Access to HE

Apprenticeships

Digital

Employability &  
Enterprise

English & Maths

ESOL

Personal & Social  
Development

Professional  
Development

Vocational

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## About this Access to HE Diploma guide

This qualification specification is intended for tutors, assessors, internal quality assurers, centre quality managers and other staff within Gateway Qualifications recognised centres and/or prospective centres.

It sets out what is required of the learner in order to achieve the qualification. It also contains information specific to managing and delivering the qualification(s) including specific quality assurance requirements.

The specification should be read in conjunction with the Gateway Qualifications Centre Handbook and other publications available on the website which contain more detailed guidance on assessment and verification practice.

In order to offer the qualification/s within this specification you must be a Gateway Qualifications recognised centre and be approved to deliver the qualification/s.

If your centre is not yet recognised and/or not yet approved to deliver the qualification, please contact our Development Team:

Telephone: 01206 911211

Email: [enquiries@gatewayqualifications.org.uk](mailto:enquiries@gatewayqualifications.org.uk)

Website: <https://www.gatewayqualifications.org.uk/advice-guidance/delivering-our-qualifications/become-recognised-centre/>

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## 1. Diploma Information

### 1.1 Overview of the Access to Higher Education Diploma

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The Access to Higher Education (HE) Diploma is a nationally recognised qualification with common requirements relating to the description of learner achievement. The Diploma is:

- a level 3 qualification, regulated by the Quality Assurance Agency (QAA) for Higher Education
- a unitised qualification, based on units of assessment which are structured in accordance with the Access to HE unit specification
- a credit-based qualification, operated in accordance with the terms of the Access to HE credit specification
- a graded qualification, as determined by the Access to HE Grading Scheme.

Details of the credit framework and requirements relating to the award of credit are provided within the Quality Assurance Agency Recognition Scheme for Access to Higher Education: The Access to Higher Education Diploma specification 2013.

Individual named Diplomas are identified by separate titles and are validated at by Gateway Qualifications as an Access Validating Agency (AVA) recognised by the Quality Assurance Agency for Higher Education (QAA). Each Diploma has its own approved set of units of assessment, governed by rules of combination, which are appropriate to the subject of the particular Diploma. The common grading requirements apply to all individual Diplomas.

### 1.2 About this Diploma

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The diploma allows learners to undertake study related to Engineering Science and Maths. Learners will have the opportunity to develop skills which will enable progression to a range of degree level programmes within the sector. Many learners join these types of degrees after following A level study, so the diploma will place the Access to HE learners on a level with those who have followed A level studies.

Learners will complete mandatory units which cover algebra, trigonometry and mathematics for science as well as a fundamental physics unit to develop underpinning skills for the optional units. They will be able to research an area of interest to them in more depth. They will study a range of optional units covering electronics, electrical circuits, engineering design, engineering dynamics, statics and structures, units related to physics and chemistry and structural mechanics. It also includes a unit on project management as that is highly relevant to the engineering industry. A range of maths units are also available to include calculus, statistics, algebra and geometry.

Ungraded units include units which will support access to higher education whilst supporting study and personal skills.

### 1.3 Purpose

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The primary purpose of Access to HE Diplomas is to provide higher education progression opportunities for adults who, because of social, education or individual circumstances, may have achieved few, if any, prior qualifications.

### 1.4 Aims

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The qualification aims to:

- reintroduce learners to education recognising prior skills and experience and the particular needs of those returning to learn
- offer learners a responsive, supportive return to learn experience at a level appropriate for entry to HE
- develop the appropriate skills such as study skills that are necessary to enable learners to succeed in their HE career
- address issues of widening participation and social inclusion
- raise learner awareness of the opportunities that a return to study and lifelong learning can bring.

### 1.5 Objectives

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The objective of the Diploma is to enable learners to:

- satisfy the general academic requirements for entry to Higher Education
- prepare learners for HE level study generally and in subject areas appropriate to an intended HE course destination
- demonstrate appropriate levels of competence in subject specific skills and knowledge
- demonstrate practical, transferable and academic skills
- develop their confidence and ability to cope with a return to education at an advanced level
- enhance personal and career opportunities
- develop as independent and lifelong learners.

### 1.6 Sector Subject Area

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4.1 Engineering

### 1.7 Target groups

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- Adults who, because of social, educational or individual circumstances may have achieved few, if any, prior qualifications and wish to progress to HE
- Adults who have gone straight into industry (perhaps following apprenticeship routes) who wish to progress to HE.



## 1.8 Delivery methods

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Delivery methods for this diploma can include:

- Face to face
- Blended learning including online platforms such as Moodle or Pearl.

Assessment methods will include academic posters, exam, controlled assessment, projects e.g. practical experiments, presentations, self-evaluation, SWOT analysis, short answer questions, reports, worksheets.

## 1.9 Achievement methodology

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The Diploma will be awarded to learners who successfully achieve an approved combination of units through a Portfolio of Evidence that has been successfully verified and monitored through Gateway Qualifications' Quality Assurance process.

The qualification is therefore determined by successful achievement of all required unit assessments with no further requirement for additional/terminal assessment.

## 1.10 Geographical coverage

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This qualification has been approved by for delivery in England.

## 1.11 Progression opportunities

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Progression routes are into a range of degrees including:

- Electronic Engineering BEng (Hons)
- Electronic and Communication Engineering including a foundation year (4 years) BEng (Hons)
- Engineering (Electrical and Electronic) (Top-Up) BSc (Hons)
- Electrical and Electronic Engineering BEng (Hons)
- BEng (Hons) General Engineering
- BEng (Hons) Mechanical Engineering
- Mathematics BSc (Hons)
- Mathematics MMath (Hons)

The qualification does not provide guaranteed entry to UK higher education.

## 1.12 Equality, Diversity and Inclusion

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It is Gateway Qualifications' aim that there shall be equal opportunities and so meet the organisation's legal responsibilities to prevent discrimination.

In accordance it is the organisation's intention that there should be no discrimination on the grounds of a protected characteristic including age, disability, gender assignment, marriage and civil partnership, pregnancy and maternity, race, religion and belief, sex, sexual orientation. It is acknowledged that this is not an exhaustive list.



## 2. Learner Entry Requirements

### 2.1 Age

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The course is designed to meet the needs of adults who have been out of full time education for a significant period of time and who have not achieved some or any formal qualifications. This generally would apply to learners over the age of 19.

### 2.2 Prior qualifications

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There is no requirement for learners to have achieved prior qualifications or units prior to undertaking this qualification.

Learners will probably require a pass in maths and English at GCSE level or a Functional Skills qualification in English and Maths to progress onto a degree course.

Providers may ask learners for GCSEs as a mark of ability at Level 2 as an appropriate entry requirement to a Level 3 course.

### 2.3 Prior skills/knowledge/understanding

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There is no requirement for learners to have prior skills, knowledge or understanding. However, learners would be expected to be able to demonstrate the skills and ability to study at Level 3.

### 2.4 Access to qualifications for learners with disabilities or specific needs

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Gateway Qualifications and recognised providers have a responsibility to ensure that the process of assessment is robust and fair and allows the learner to show what they know and can do without compromising the rigour of the assessment used to evidence the criteria.

Gateway Qualification has a duty to permit a reasonable adjustment where an assessment arrangement would disadvantage a learner with a disability, medical condition or learning need.

The following adaptations are examples of what may be considered for the purposes of facilitating access, as long as they do not impact on any competence standards being tested:

- adapting assessment materials
- adaptation of the physical environment for access purposes
- adaptation to equipment
- assessment material in an enlarged format or Braille
- permitting readers, signers, scribe, prompter, practical assistant
- changing or adapting the assessment method
- extra time, e.g. assignment extensions
- transcript

- use of assistive software where the software does not influence the learners' ability to demonstrate the skills, knowledge or understanding e.g. use of spellchecker in an English assessment
- using assistive technology
- use of CCTV, coloured overlays, low vision aids
- use of a different assessment location
- use of ICT/responses using electronic devices.

It is important to note that not all of the adjustments (as above) will be reasonable, permissible or practical in particular situations. The learner may not need, nor be allowed the same adjustment for all assessments.

Learners should be fully involved in any decisions about adjustments/adaptations. This will ensure that individual needs can be met, whilst still bearing in mind the specified assessment criteria for a particular qualification.

A reasonable adjustment for a particular learner may be unique to that individual and may not be included in the list of available access arrangements specified above.

Details on how to make adjustments for learners is set out in the Reasonable Adjustment and Special Considerations Policy and Procedures.

## **2.5 Additional requirements/guidance**

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Learners must have a UK address (including BFO) to be registered on an Access to HE Diploma.

## **2.6 Recruiting learners with integrity**

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It is vital that providers recruit with integrity. Providers must ensure that learners have the correct information and advice on their selected qualification(s) and that the qualification(s) will meet their needs.

The recruitment process must include the provider undertaking the assessment of each potential learner and making justifiable and professional judgements about the learner's potential to successfully complete the assessment and achieve the qualification. Such an assessment must identify, where appropriate, the support that will be made available to the learner to facilitate access to the qualification.

## 3. Achieving the Access to HE Diploma

### 3.1 Qualification specification

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The generic requirements for the Access to HE Diploma are that learners must achieve a total of 60 credits of which 45 credits must be achieved at level 3 from graded units that are concerned with academic subject and the remaining 15 credits can be achieved at level 2 or level 3 from units which are ungraded. It is recommended you include no more than 6 ungraded 'academic subject content' credits. The ungraded credits can be mandatory or optional within the Diploma. The approved Rules of Combination for this qualification are detailed below.

Where there is a selection of optional units within the permitted rules of combination, the selection of units to be used to form the Diploma course must be made before the learners are registered. Learners must be registered with Gateway Qualifications within 12 weeks of the start of the course or before application to UCAS, whichever is soonest.

### 3.2 Rules of Combination

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The structure sets out the units required to be achieved the Access to Diploma, comprising of:

- Graded Academic mandatory units – Level 3
- Graded Academic optional units - Level 3
- Graded Research units - Level 3
- Ungraded units – Level 2/3.

Learners must achieve a total of 60 credits and meet unit group requirements.

Learners must complete a total of 60 credits of which 45 credits must be achieved at level 3 from graded units which are concerned with academic subject content and the remaining 15 credits must be achieved at level 3 from units which are ungraded.

Learners must complete 9 credits must be taken from the mandatory group. A maximum of 6 credits must be taken from the Research optional group, and the remaining 30 credits may be taken from either the Engineering Science or Mathematics Optional Groups. Learners

must complete 15 credits of ungraded units with 9 credits from the Mandatory ungraded group and 6 credits from the optional ungraded group.

**Mandatory Units: Graded Academic Subject Content**

Learners must achieve 9 credits from this group.

Unit Code	Unit Title	Level	Credits	Content	Grade Descriptors	Suggested Assessment methods	Assessment Volume
QU019995	Algebra Trigonometry	3	3	Academic	1, 3, 7	Exam	2 hours closed book
QU025282	Fundamental Physics: Theory	3	6	Academic	1, 7	Structured questions 2 x Scientific reports Practical investigations	1000 words 2 x 750 words Practical investigations
QU006176	Mathematics for Science	3	3	Academic	3, 7	Exam	2 x 1 hour closed book

**Graded Research Units:**

Learners must achieve 6 credits from this group.

Unit Code	Unit Title	Level	Credits	Content	Grade Descriptors	Suggested Assessment methods	Assessment Volume
QU028886	Research: Extended Writing Project for Engineering Science and Maths	3	6	Academic	2, 3, 4, 6, 7	Risk assessment Project diary Project proposal Research review Report Evaluation	250 words 500 words 250 words 500 words 1250 words 250 words
QU028379	Research: Practical Investigation Project for Engineering Science	3	6	Academic	2, 3, 4, 6, 7	Research plan Research report Evidence of research carried out	200 words 2500 words 300 words

### Optional Graded Academic Units: Engineering Science

Learners may complete up to 30 credits from this group.

Unit Code	Unit Title	Level	Credits	Content	Grade Descriptors	Suggested Assessment methods	Assessment Volume
QU007973	Electric Circuits	3	3	Academic	3, 7	Exam	2 hours closed book
QU007906	Electrical Principles	3	3	Academic	1, 3, 7	Report	1500 words
QU027886	Electronics	3	6	Academic	2, 3, 7	Scientific practical and accompanying report Report	1500 words and experiments 1500 words
QU006259	Energetics, Kinetics, Equilibria	3	3	Academic	2, 3, 7	Worksheets Practical and accompanying report	750 words 750 words
QU026955	Engineering Design: CAD	3	3	Academic	3, 7	Portfolio of evidence containing – 2D and 3D designs to include printouts/screenshots of completed work with annotation to clearly show the process followed to complete the task.	500 words
QU026951	Engineering Dynamics	3	3	Academic	3, 7	Exam	1.5 hours open book
QU026953	Engineering Statics and Structures	3	3	Academic	3, 7	Exam	1.5 hours open book
QU006301	Fundamental Chemistry	3	6	Academic	2, 3, 4, 7	Investigation and report Exam	1500 words 1.5 hours open book
QU028385	Heat, Electricity and Magnetism	3	3	Academic	2, 3, 7	Academic post and presentation Controlled assessment	750 word and 5 minutes 1 hour closed book
QU026127	Introduction to Computer Systems	3	6	Academic	1, 3, 7	Academic post and presentation	400 words and 5 minutes

Unit Code	Unit Title	Level	Credits	Content	Grade Descriptors	Suggested Assessment methods	Assessment Volume
						Report Exam	1000 words 1.5 hours closed book
QU016763	Project Management	3	3	Academic	1, 3, 7	Project plan and report	1000 words
QU017117	Structural Mechanics in Construction and Civil Engineering	3	6	Academic	1, 3, 7	Practical project and report containing mathematical and graphical calculations Academic post and presentation	1000 words  500 words and 5 minutes

### Optional Graded Academic Units: Mathematics

Learners may complete up to 21 credits from this group.

Unit Code	Unit Title	Level	Credits	Content	Grade Descriptors	Suggested Assessment methods	Assessment Volume
QU007967	Calculus: Differentiation	3	3	Academic	2, 3, 7	Controlled assessment	2 hours closed book
QU007965	Calculus: Integration	3	3	Academic	3, 7	Controlled assessment	2 hours closed book
QU017259	Geometry	3	3	Academic	3, 7	Exam	2 hours closed book
QU007424	Mathematics: Algebra, Exponentials and Logarithms	3	3	Academic	3, 5, 7	Worksheets	2 hours
QU007941	Matrices	3	3	Academic	2, 3, 7	Controlled assessment	2 hours closed book
QU007442	Quantitative Methods – Statistics				3, 4, 5, 7	Data analysis short answer questions Create charts and graphs Worksheets Case study analysis of data Tree diagrams	500 words  500 words 250 words 250 words
QU007957	Series	3	3	Academic	2, 3, 7	2 x Closed book exams	2 x 1 hour closed book



### Mandatory Units: Ungraded

Learners must achieve 9 credits from this group.

Unit Code	Unit Title	Level	Credits	Content	Suggested Assessment methods	Assessment Volume
QU007486	Application of Number – Interpreting and Presenting Information	3	3	Other	2 x controlled assessments	2 x 1 hour assessments
QU010772	Practical Science Skills	3	3	Academic	Investigation Report Reflection	Practical investigation 750 words 250 words
QU025532	Preparation for Higher Education	3	3	Other	Research	Review of research

### Optional Units: Ungraded

Learners must achieve 6 credits from this group.

Unit Code	Unit Title	Level	Credits	Content	Suggested Assessment methods	Assessment Volume
QU026150	Computer Data Protection	3	3	Academic	Structured questions Case study analysis	750 words 750 words
QU029027	Introduction to Computer Programming	3	3	Academic	2 x Computer programmes with development diary	2 x Programmes with 500 word development diary
QU025280	Optimising Examination Performance	3	3	Other	Examination preparation plan	500 words
QU027084	Presenting Information Using ICT	3	3	Other	Notes from a range of sources Presentation (word processed, spreadsheet, presentation) Presentation lecture notes and handouts	300 words Presentation 200 words

Unit Code	Unit Title	Level	Credits	Content	Suggested Assessment methods	Assessment Volume
QU028487	Promoting Wellbeing and Building Resilience	3	3	Other	Presentation lecture notes and handouts	1500 words
QU026344	References and Reliability of Sources	3	3	Other	Literature review	1500 words including recognised form of referencing and bibliography
QU011467	Spreadsheets	3	3	Other	Case study analysis and creation of spreadsheets to meet customer needs, manipulation of data within spreadsheets, create graphs, charts and pivot tables, report	500 words
QU033854	Sustainability Project	3	3	Academic	Report, including project plan and reflection	1000 words
QU033880	The Fundamentals of Environmental Sustainability	3	3	Academic	Report	1500 words
QU026155	Writing Reports	3	3	Other	Report plan Presentation of report plan Report	Plan 2-3 minutes 1000 words

### 3.3 Additional completion requirements

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Learners will probably require a pass in maths and English at GCSE level or a Functional Skills qualification in English and Maths to progress onto a degree course.

Delivery providers should make learners aware of HEI course entry requirements.

### 3.4 Recognition of Prior Learning

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Recognition of prior learning is a process that considers if a learner can meet the specified assessment requirements through knowledge, understanding or skills that they already possess and that can contribute towards the attainment of a qualification for which they are undertaking.

For further information please refer Annex C, Access to HE Diploma Specification, <https://www.accesstohe.ac.uk/AboutUs/Publications/Documents/Access-Diploma-Specification.pdf>

## 4. Access to HE Units of Assessment

### 4.1 Unit specification

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A common unit specification applies to all units with Access to HE Diplomas the unit specification follows a standard template covering the following elements:

- title
- level
- credit value
- unit code
- learning outcomes
- assessment criteria
- grade descriptors
- type of unit (academic subject content or not).

The units of assessment for the Access to HE Diploma (Engineering Science and Mathematics) are contained within this Access to HE Diploma Guide.

### 4.2 Academic subject content

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A unit is classified as having academic subject content, if the unit's knowledge and skills are directly related to the subject of the name of the Access to HE Diploma. Units will not meet the academic subject content requirement if they are principally concerned with personal development, generic English or mathematics, or study skills.

### 4.3 Graded and ungraded units

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**Graded units** – grading operates at unit level and only applies to units which have been approved by Gateway Qualifications within a named Access to HE Diploma. Learner achievement for graded units is recorded as Pass, Merit or Distinction for each unit, as set out in the QAA Access to HE Grading Scheme, 2012. Graded units will also satisfy the criteria of academic subject content.

There is a common set of broad generic grade descriptors which are used as the basis for all grading judgements on all courses:

- 1 Understanding the subject
- 2 Application of knowledge
- 3 Application of skills
- 4 Use of knowledge
- 5 Communication and presentation
- 6 Autonomy / Independence
- 7 Quality.

The seven grade descriptors are not subject specific. They can, however, through careful selection and in appropriate combinations, be used on all courses, with all units and for all

assignments. The descriptors to be used with a particular unit are selected with reference to the main aspects of learner performance that need to be taken into account when grading decisions are made for that unit. They are formally assigned to the unit when it is validated.

Each of the seven grade descriptors comprises two sets of components, one which describes characteristics or qualities typical of performance at merit, and a parallel set of components which describes typical performance in the same areas at distinction. (There are no components for pass, because a pass grade is gained when a learner meets the learning outcomes but does not achieve the standard required for merit.) Some of these components are more relevant to certain subjects than others and some particular terms are also more relevant for use with particular types of assessment than others. In order to ensure the grade descriptors are relevant for specific assignments, tutors identify the components of the descriptors being used that are most relevant for the particular assignment. The selected components of the descriptors (at merit and distinction) are then included in the assignment brief(s).

The grading scheme is not based on an assumed one-to-one relationship between the grade descriptors and learning outcomes (although it is possible that in some units, because of the way the learning outcomes have been structured, something close to a one-to-one relationship may emerge). In general, however, judgements about learner work in relation to grading apply across the work for a unit, whether that unit is assessed through one, or more than one, assignment.

The full Grade Descriptors can be accessed by the following link, which also provides detailed information on grading:

<http://www.accesstohe.ac.uk/AboutUs/Publications/Documents/Access-Grading-Scheme-Section-B.pdf>

## 4.4 Revisions to Access to HE Units of Assessment

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Gateway Qualifications reserves the right to review and amend units of assessment and will issue providers notification of the changes to the units of assessment. Gateway Qualifications undertakes regular unit reviews to ensure currency of units, providers are required to use updated versions where units are replaced.

## 5. Assessment and Quality Assurance

### 5.1 Provider requirements

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Providers must be approved by Qualifications as centre and are required to ensure that:

- the main base is in the UK
- systems are in place to ensure that only learners with a UK address (including BFO) are registered for an Access to HE Diploma
- there are clear arrangements for the day-to-day operational management and coordination of Access to HE delivery.
- there are appropriate facilities and resources at each site, and for each mode of delivery
- staff have the professional competence and skills to teach and assess necessary to teach and assess the units available on the Diploma
- arrangements are in place to provide pre-course guidance to applicants and criteria for selection and admission to Access to HE Diplomas and are consistent with QAA requirements with respect to admissions.  
<https://www.accesstohe.ac.uk/AboutUs/Publications/Documents/Guidance-admission-of-learners-AHE-07.pdf>.
- expertise and resources to provide information, advice and guidance on HE applications and progression opportunities.
- Systems for maintaining secure records of individual learners' registration and achievement
- internal moderation arrangements that meet Gateway Qualification requirements.
- arrangements for internal course monitoring and self-evaluation and feedback
- procedures and criteria for the recognition of prior learning that meet Gateway Qualifications requirements.
- quality assurance procedures relating to the delivery of provision, including transparent processes for handling appeals and complaints.

Providers should refer to the Gateway Qualifications' Access to HE Provider Handbook for further information on centre requirements.

### 5.2 Staffing requirements

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Providers are required to ensure that:

- staff have the professional competence and skills to teach and assess necessary to teach and assess the units available on the Diploma
- staff have expertise to provide information, advice and guidance on HE applications and progression opportunities.

### 5.3 Facilities and resources

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Learners will require access to a science laboratory for science units and computers with relevant software for CAD, graphs and charts and other engineering units. Resources will be checked as part of the provider approval of this Access to HE Diploma

## 5.4 Quality Assurance Requirements

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Gateway Qualifications applies a quality assurance model to the Access to HE Diploma of:

- internal assessment and internal verification by the provider
- moderation by Gateway Qualifications comprising of centre moderation and subject moderation.

These processes are set out within Quality Assurance section of the Gateway Qualifications' Access to HE Provider Handbook.

## 5.5 Additional requirements/guidance

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There are no additional requirements that Learners must satisfy in order for assessment to be undertaken and the unit/qualification to be awarded.



## 6. Unit Details

### Mandatory Units: Graded Academic Subject Content

#### Access to HE Diploma Unit

<b>Unit Code:</b>	QU019995		
<b>Title:</b>	Algebra and Trigonometry		
<b>Unit Level:</b>	Level 3	<b>Unit Credit:</b>	3
<b>Grading type:</b>	Graded		
<b>Grade Descriptors:</b>	<ul style="list-style-type: none"> <li>• GD1-Understanding the subject</li> <li>• GD3-Application of skills</li> <li>• GD7-Quality</li> </ul>		
<b>Academic subject content/other:</b>	Academic Subject Content		
<b>Assessment details:</b>	Two hours closed book exam.		

This unit has 3 learning outcomes.

LEARNING OUTCOMES	ASSESSMENT CRITERIA
<b>The learner will:</b>	<b>The learner can:</b>
1 Understand algebraic expressions.	1.1 Distinguish the different roles played by letters, knowing what letter symbols represent in equations, formulae and identities. 1.2 Manipulate algebraic expressions by taking out common factors and factorising quadratic expressions  <i>This may include the difference of two squares, reciprocal functions and cancelling common factors in rational expressions.</i> 1.3 Set up and solve simple equations by using inverse operations or by transforming both sides in the same way. 1.4 Solve linear equations.  <i>This includes:</i> a. equations in one unknown, with integer or fractional coefficients, in which the unknown appears on either side or on both sides of the equation

LEARNING OUTCOMES	ASSESSMENT CRITERIA
The learner will:	The learner can:
	<i>b. equations that require prior simplification of brackets, including those that have negative signs occurring anywhere in the equation, and those with a negative solution</i>
2 Understand trigonometric functions.	2.1 Solve problems using Pythagoras' theorem. 2.2 Solve problems involving sine, cosine and tangent. 2.3 Solve problems involving angles of elevation or depression. 2.4 Solve problems involving 3D shapes. 2.5 Solve problems involving the sine rule. 2.6 Solve problems involving the cosine rule. 2.7 Solve problems involving circular functions.
3 Understand trigonometric identities and equations.	3.1 Prove identities using basic identities. 3.2 Prove identities using complex identities. 3.3 Simplify an expression using trigonometric identities. 3.4 Solve a trigonometric equation.

### Access to HE Diploma Unit

<b>Unit Code:</b>	QU025282		
<b>Title:</b>	Fundamental Physics: Theory		
<b>Unit Level:</b>	Level 3	<b>Unit Credit:</b>	6
<b>Grading type:</b>	Graded		
<b>Grade Descriptors:</b>	<ul style="list-style-type: none"> <li>• GD1-Understanding the subject</li> <li>• GD7-Quality</li> </ul>		
<b>Academic subject content/other:</b>	Academic Subject Content		
<b>Assessment details:</b>	1000 words ~ Structured questions 2 x 750 words ~ Scientific reports Practical investigations		

This unit has 5 learning outcomes.

LEARNING OUTCOMES	ASSESSMENT CRITERIA
<b>The learner will:</b>	<b>The learner can:</b>
1 Understand forces in action.	1.1 Explain the types of forces acting in given situations. 1.2 Find the position of centre and gravity of a uniform body, justifying the answer. 1.3 Explain key forces acting on the human body in a given situation.
2 Understand static and hydrostatic pressure.	2.1 Explain situations in which different combinations of forces and areas create different pressures. 2.2 Analyse the movement of gases in relation to atmosphere pressure. 2.3 Explain how pressure changes are accommodated by biological systems.
3 Understand Hooke's law in relation to stretching and compressing.	3.1 Summarise Hooke's law in relation to stretching and compressing. 3.2 Evaluate data from stretching experiments. 3.3 Compare and contrast how two different materials behave under stress and strain in the human body.
4 Understand the action of levers.	4.1 Explain the Principle of Moments. 4.2 Calculate the forces/distance required to achieve equilibrium.

LEARNING OUTCOMES	ASSESSMENT CRITERIA
The learner will:	The learner can:
	4.3 Explain the role of levers and joints in achieving a vertical posture in humans.
5 Understand the concepts of current voltage and resistance.	5.1 Explain the relationship between current, voltage and resistance. 5.2 Calculate the electrical resistance of various components. 5.3 Evaluate how electrical concepts are put to use in a given medical device or procedure.

### Access to HE Diploma Unit

<b>Unit Code:</b>	QU006176		
<b>Title:</b>	Mathematics for Science		
<b>Unit Level:</b>	Level 3	<b>Unit Credit:</b>	3
<b>Grading type:</b>	Graded		
<b>Grade Descriptors:</b>	<ul style="list-style-type: none"> <li>• GD3-Application of skills</li> <li>• GD7-Quality</li> </ul>		
<b>Academic subject content/other:</b>	Academic subject content		
<b>Assessment details:</b>	See assessment grid		

This unit has 5 learning outcomes.

<b>LEARNING OUTCOMES</b>	<b>ASSESSMENT CRITERIA</b>
<b>The learner will:</b>	<b>The learner can:</b>
1. Understand how to perform calculations with integers, decimals and fractions.	1.1 Make calculations involving integers, decimals and fractions with or without a calculator. 1.2 Give answers to calculations correct to a specified number of decimal places or significant figures. Using accuracy appropriate to the nature of the data.
2. Understand how to perform calculations with percentages.	2.1 With and without a calculator, convert between percentages, decimals and fractions. 2.2 Express one quantity as a percentage of another. 2.3 Find a percentage of a quantity. 2.4 Calculate percentage increase and decrease; direct and inverse problems.
3. Understand how to use standard form, indices and roots.	3.1 Make conversions between ordinary numbers and standard form. 3.2 Use the exponential key and interpret calculator displays. 3.3 Make calculations involving indices and roots.

<b>LEARNING OUTCOMES</b>	<b>ASSESSMENT CRITERIA</b>
<b>The learner will:</b>	<b>The learner can:</b>
	3.4 Apply index laws to simplify expressions involving powers and roots.
4. Understand how to evaluate formulae.	4.1 Evaluate formulae by substitution using the full range of functions on a scientific calculator.
5. Understand how to calculate area and volume.	5.1 Calculate the surface area of plane geometric figures and the volume of complex geometric figures.

## Graded Research Units

### Access to HE Diploma Unit

<b>Unit Code:</b>	QU028886		
<b>Title:</b>	Research: Extended Writing Project for Engineering Science and Maths		
<b>Unit Level:</b>	Level 3	<b>Unit Credit:</b>	6
<b>Grading type:</b>	Graded		
<b>Grade Descriptors:</b>	<ul style="list-style-type: none"> <li>• GD2-Application of knowledge</li> <li>• GD3-Application of skills</li> <li>• GD4-Use of information</li> <li>• GD6-Autonomy/Independence</li> <li>• GD7-Quality</li> </ul>		
<b>Academic subject content/other:</b>	Academic Subject Content		
<b>Assessment details:</b>	Risk assessment ~ 250 words Project diary ~ 500 words Project proposal ~ 250 words Research review ~ 500 words Report ~ 1250 words Evaluation ~ 250 words		

This unit has 5 learning outcomes.

<b>LEARNING OUTCOMES</b>	<b>ASSESSMENT CRITERIA</b>
<b>The learner will:</b>	<b>The learner can:</b>
1 Be able to plan an extended writing project.	1.1 Identify and agree an extended writing project located within a knowledge domain relevant to the named Diploma. 1.2 Develop a project brief. 1.3 Identify any ethical, practical or safety issues, explaining how these will be managed/overcome. 1.4 Maintain a record of project progress through all stages of research, development and completion.
2 Be able to conduct research.	2.1 Identify and conduct in-depth research from a wide range of sources.
3 Be able to develop ideas.	3.1 Select appropriate information and/or evidence. 3.2 Analyse findings and develop ideas.



LEARNING OUTCOMES	ASSESSMENT CRITERIA
<b>The learner will:</b>	<b>The learner can:</b>
	3.3 Produce a body of work which meets the brief and includes complex ideas.
4 Be able to present the project.	4.1 Write coherently in a conventional style, appropriate to the knowledge domain. 4.2 Reference all sources using a recommended style of referencing.
5 Be able to evaluate own writing project.	5.1 Evaluate own writing in relation to project brief. 5.2 Identify recommendations for the future.

### Access to HE Diploma Unit

<b>Unit Code:</b>	QU028379		
<b>Title:</b>	Research: Practical Investigation Project for Engineering Science		
<b>Unit Level:</b>	Level 3	<b>Unit Credit:</b>	6
<b>Grading type:</b>	Graded		
<b>Grade Descriptors:</b>	<ul style="list-style-type: none"> <li>• GD2-Application of knowledge</li> <li>• GD3-Application of skills</li> <li>• GD4-Use of information</li> <li>• GD6-Autonomy/Independence</li> <li>• GD7-Quality</li> </ul>		
<b>Academic subject content/other:</b>	Academic Subject Content		
<b>Assessment details:</b>	Refer to assessment grid		

This unit has 4 learning outcomes.

LEARNING OUTCOMES	ASSESSMENT CRITERIA
<b>The learner will:</b>	<b>The learner can:</b>
1 Be able to plan a practical investigation project.	1.1 Identify and agree a practical investigation project, located within a knowledge domain relevant to the Engineering. 1.2 Produce a hypothesis and clear aims for the investigation project. 1.3 Identify any ethical, practical or safety issues and how these will be managed/overcome. 1.4 Produce a risk assessment. 1.5 Maintain a record of project progress through all stages of research, development and completion.
2 Be able to undertake a practical investigation.	2.1 Carry out research from a wide range of sources. 2.2 Develop an appropriate investigation. 2.3 Identify the variables and explain how they can be controlled, where necessary. 2.4 Carry out the investigation safely, using appropriate practical skills and techniques.

LEARNING OUTCOMES	ASSESSMENT CRITERIA
<b>The learner will:</b>	<b>The learner can:</b>
	2.5 Analyse the results of the investigation with reference to relevant theory.
3 Know how to present the project.	3.1 Present the body of work in a style appropriate to the knowledge domain with clear conclusions. 3.2 Use appropriate technical terminology fluently. 3.3 Reference all findings using a recommended style of referencing.
4 Be able to evaluate own research project.	4.1 Reflect on the design and methodology of the project. 4.2 Evaluate the body of work in relation to aims and hypothesis. 4.3 Identify recommendations for the future.

## Optional Graded Academic Units – Engineering Science

### Access to HE Diploma Unit

<b>Unit Code:</b>	QU007973		
<b>Title:</b>	Electric Circuits		
<b>Unit Level:</b>	Level 3	<b>Unit Credit:</b>	3
<b>Grading type:</b>	Graded		
<b>Grade Descriptors:</b>	<ul style="list-style-type: none"> <li>• GD3-Application of skills</li> <li>• GD7-Quality</li> </ul>		
<b>Academic subject content/other:</b>	Academic Subject Content		
<b>Assessment details:</b>	Exam ~ 2 hours closed book		

This unit has 2 learning outcomes.

<b>LEARNING OUTCOMES</b>	<b>ASSESSMENT CRITERIA</b>
<b>The learner will:</b>	<b>The learner can:</b>
1 Understand direct current (dc).	1.1 Solve problems involving charge, current and potential difference. 1.2 Solve circuit problems involving resistors in series and/or parallel. 1.3 Solve problems involving electromotive force. 1.4 Use Kirchhoff's laws to solve circuit problems. 1.5 Solve circuit problems involving energy and power in dc circuits. 1.6 Solve circuit problems involving capacitors.
2 Understand alternating current (ac).	2.1 Find inductive resistance. 2.2 Find capacitive resistance. 2.3 Solve problems involving resistance, inductance and capacitance. 2.4 Solve problems involving power in ac circuits.

### Access to HE Diploma Unit

<b>Unit Code:</b>	QU007906		
<b>Title:</b>	Electrical Principles		
<b>Unit Level:</b>	Level 3	<b>Unit Credit:</b>	3
<b>Grading type:</b>	Graded		
<b>Grade Descriptors:</b>	<ul style="list-style-type: none"> <li>• GD1-Understanding the subject</li> <li>• GD3-Application of skills</li> <li>• GD7-Quality</li> </ul>		
<b>Academic subject content/other:</b>	Academic Subject Content		
<b>Assessment details:</b>	Refer to assessment grid		

This unit has 3 learning outcomes.

LEARNING OUTCOMES	ASSESSMENT CRITERIA
<b>The learner will:</b>	<b>The learner can:</b>
1 Understand waveforms and determine the main parameters used to describe and measure them.	1.1 Define the terms amplitude, period, frequency, instantaneous, peak-to-peak, r.m.s., average in relation to alternating (sinusoidal and non-sinusoidal) and unidirectional waveforms. 1.2 Define form factor and determine the approximate average and r.m.s. value of given sinusoidal waveforms.
2 Be able to apply phasor and algebraic representation of sinusoidal quantities.	2.1 Define a phasor quantity. 2.2 Determine the resultant of the addition of two sinusoidal voltages by graphical and phasor implementation. 2.3 Explain the phase angle relationship between the two alternating quantities. 2.4 Define a sinusoidal voltage in the form $v = V_m \sin(\omega t + \phi)$ .

LEARNING OUTCOMES	ASSESSMENT CRITERIA
<b>The learner will:</b>	<b>The learner can:</b>
3 Be able to apply the basic theory of balanced three-phase circuits to the solution of problems.	3.1 Describe the nature of, and summarise the reasons for, a three-phase supply network, with reference to the National Grid distribution system. 3.2 Explain the need for star and delta connections for power distribution and distinguish between delta and star (3 wire and 4 wire) methods of connection. 3.3 Apply the basic relationships between line and phase quantities under balanced conditions to solve single problems. 3.4 Explain the power dissipation in a three-phase load is the sum of the single-phase powers and that the power in a balanced three-phase load is: square root of $3 \cdot V_{LINE} \cdot I_{LINE} \cdot \cos \phi$ .

### Access to HE Diploma Unit

<b>Unit Code:</b>	QU027886		
<b>Title:</b>	Electronics		
<b>Unit Level:</b>	Level 3	<b>Unit Credit:</b>	6
<b>Grading type:</b>	Graded		
<b>Grade Descriptors:</b>	<ul style="list-style-type: none"> <li>• GD2-Application of knowledge</li> <li>• GD3-Application of skills</li> <li>• GD7-Quality</li> </ul>		
<b>Academic subject content/other:</b>	Academic subject content		
<b>Assessment details:</b>	Refer to assessment grid		

This unit has 5 learning outcomes.

<b>LEARNING OUTCOMES</b>	<b>ASSESSMENT CRITERIA</b>
<b>The learner will:</b>	<b>The learner can:</b>
1 Understand concepts and devices appropriate to analogue and digital electronic systems.	1.1 Apply the correct terminology to describe semi conductor n and p type materials
2 Be able to carry out information searches on manufacturers' data sheets.	2.1 Describe the operation and compare the characteristics of a range of electronic components.  This may include: p-n junction diode, zener diode, bipolar transistor, unipolar transistor, class A small signal amplifier, transistor models, series voltage regulator, combinational logic gates.
3 Be able to select appropriate devices for specified purposes.	3.1 Identify and select components from manufacturers' data sheets to design simple circuits.  This may include simple d.c. power supply, series voltage regulator, simple transistor switching unit, single stage class A amplifier, simple combinational logic circuits.
4 Be able to test devices and systems against specifications.	4.1 Construct and test the circuits against the specification.

<b>LEARNING OUTCOMES</b>	<b>ASSESSMENT CRITERIA</b>
<b>The learner will:</b>	<b>The learner can:</b>
5 Be able to communicate test results effectively.	5.1 Report on the tests completed using correct terminology and technical terms.



### Access to HE Diploma Unit

<b>Unit Code:</b>	QU006259		
<b>Title:</b>	Energetics, Kinetics, Equilibria		
<b>Unit Level:</b>	Level 3	<b>Unit Credit:</b>	3
<b>Grading type:</b>	Graded		
<b>Grade Descriptors:</b>	<ul style="list-style-type: none"> <li>• GD2-Application of knowledge</li> <li>• GD3-Application of skills</li> <li>• GD7-Quality</li> </ul>		
<b>Academic subject content/other:</b>	Academic subject content		
<b>Assessment details:</b>	See assessment grid		

This unit has 4 learning outcomes.

LEARNING OUTCOMES	ASSESSMENT CRITERIA
<b>The learner will:</b>	<b>The learner can:</b>
1 Understand the mole concept.	1.1 Apply the mole concept to describe quantity of substance. 1.2 Calculate a mass from a number of moles and vice versa.
2 Understand the energetics of chemical reactions.	2.1 Explain that reactions are accompanied by an energy change. 2.2 Draw reaction profile diagrams to differentiate between exothermic and endothermic reactions. 2.3 Calculate enthalpy changes using bond energies.
3 Understand the factors affecting kinetics.	3.1 Describe the factors influencing reaction rate. 3.2 Explain the effect of temperature concentration and surface area using the collision theory. 3.3 Define activation energy and explain its influences on rate. 3.4 Describe and explain the action of a catalyst. 3.5 Use the Maxwell-Boltzman distribution to explain the effect of a catalyst. 3.6 Explain the effect of mechanism on rate.

LEARNING OUTCOMES	ASSESSMENT CRITERIA
<b>The learner will:</b>	<b>The learner can:</b>
4 Be able to apply equilibrium concepts to chemical reactions.	4.1 Explain the characteristics of the equilibrium state. 4.2 Define and apply Le Chaterliers principle. 4.3 Explain on a simple level the changes that occur when an equilibrium is disturbed.

### Access to HE Diploma Unit

<b>Unit Code:</b>	QU026955		
<b>Title:</b>	Engineering Design - CAD		
<b>Unit Level:</b>	Level 3	<b>Unit Credit:</b>	3
<b>Grading type:</b>	Graded		
<b>Grade Descriptors:</b>	<ul style="list-style-type: none"> <li>• GD3-Application of skills</li> <li>• GD7-Quality</li> </ul>		
<b>Academic subject content/other:</b>	Academic Subject Content		
<b>Assessment details:</b>	Portfolio of evidence containing: - 2D and 3D designs to include printouts/screen shots of completed work with annotation to clearly show the process followed to complete the tasks.		

This unit has 2 learning outcomes.

LEARNING OUTCOMES	ASSESSMENT CRITERIA
<b>The learner will:</b>	<b>The learner can:</b>
1. Understand 2D design.	1.1 Produce 2D geometric objects. 1.2 Produce 2D objects to given measurements. 1.3 Perform editing techniques on 2D objects. 1.4 Create a layout plan.
2. Understand 3D design.	2.1 Create symbols and link these to text using Computer-Aided Design. 2.2 Create a plan with symbols repeated at least once. 2.3 Create 3D objects. 2.4 Produce drawing.  <i>For example: using layers, classes, sheets.</i>

### Access to HE Diploma Unit

<b>Unit Code:</b>	QU026951		
<b>Title:</b>	Engineering Dynamics		
<b>Unit Level:</b>	Level 3	<b>Unit Credit:</b>	3
<b>Grading type:</b>	Graded		
<b>Grade Descriptors:</b>	<ul style="list-style-type: none"> <li>• GD3-Application of skills</li> <li>• GD7-Quality</li> </ul>		
<b>Academic subject content/other:</b>	Academic Subject Content		
<b>Assessment details:</b>	Exam ~ 1.5 hours open book		

This unit has 2 learning outcomes.

LEARNING OUTCOMES	ASSESSMENT CRITERIA
<b>The learner will:</b>	<b>The learner can:</b>
1. Understand kinematics.	1.1 Solve problems involving motion with constant acceleration. 1.2 Solve problems involving motion with variable acceleration. 1.3 Solve problems involving circular motion. 1.4 Solve problems involving simple harmonic motion.
2. Understand kinetics.	2.1 Solve problems involving forces acting on a single particle. 2.2 Solve problems involving forces acting on connected particles. 2.3 Solve problems involving linear momentum. 2.4 Solve problems involving work and energy.

### Access to HE Diploma Unit

<b>Unit Code:</b>	QU026953		
<b>Title:</b>	Engineering Statics and Structures		
<b>Unit Level:</b>	Level 3	<b>Unit Credit:</b>	3
<b>Grading type:</b>	Graded		
<b>Grade Descriptors:</b>	<ul style="list-style-type: none"> <li>• GD3-Application of skills</li> <li>• GD7-Quality</li> </ul>		
<b>Academic subject content/other:</b>	Academic Subject Content		
<b>Assessment details:</b>	Exam ~ 1.5 hours open book		

This unit has 2 learning outcomes.

LEARNING OUTCOMES	ASSESSMENT CRITERIA
<b>The learner will:</b>	<b>The learner can:</b>
1. Understand statics.	1.1 Solve problems involving the equilibrium of a particle. 1.2 Solve problems involving friction. 1.3 Solve problems involving the moment of a force. 1.4 Solve problems involving centre of mass.
2. Understand structures.	2.1 Solve problems involving stress and strain. 2.2 Solve problems involving forces in pin-jointed frames. 2.3 Solve problems involving second moments of area. 2.4 Solve problems involving the bending of a beam.

### Access to HE Diploma Unit

<b>Unit Code:</b>	QU006301		
<b>Title:</b>	Fundamental Chemistry		
<b>Unit Level:</b>	Level 3	<b>Unit Credit:</b>	6
<b>Grading type:</b>	Graded		
<b>Grade Descriptors:</b>	<ul style="list-style-type: none"> <li>• GD2-Application of knowledge</li> <li>• GD3-Application of skills</li> <li>• GD4-Use of information</li> <li>• GD7-Quality</li> </ul>		
<b>Academic subject content/other:</b>	Academic Subject Content		
<b>Assessment details:</b>	See assessment grid		

This unit has 6 learning outcomes.

<b>LEARNING OUTCOMES</b>	<b>ASSESSMENT CRITERIA</b>
<b>The learner will:</b>	<b>The learner can:</b>
1 Understand chemical nomenclature both inorganic and organic.	1.1 Identify and explain chemicals from chemical formulae and structures.
2 Understand the techniques of chemical analysis.	2.1 Explain spectroscopy and chromatography in simple terms. 2.2 Explain different types of spectroscopy.
3 Understand how to balance chemical equations.	3.1 Explain chemical equations.
4 Understand basics of bonding.	4.1 Explain four main types of bonding and relate them to the position of the elements in the periodic table.
5 Understand how to use chemical equipment.	5.1 Explain a variety of equipment found in a chemistry lab. 5.2 Critically analyse the faults in an experiment and suggest ways of improvement.
6 Understand how to relate chemistry to own life.	6.1 Explain chemistry in everyday situations such as the home or body. 6.2 Explain examples of applications of chemistry in everyday life.

### Access to HE Diploma Unit

<b>Unit Code:</b>	QU028385		
<b>Title:</b>	Heat, Electricity and Magnetism		
<b>Unit Level:</b>	Level 3	<b>Unit Credit:</b>	3
<b>Grading type:</b>	Graded		
<b>Grade Descriptors:</b>	<ul style="list-style-type: none"> <li>• GD2-Application of knowledge</li> <li>• GD3-Application of skills</li> <li>• GD7-Quality</li> </ul>		
<b>Academic subject content/other:</b>	Academic Subject Content		
<b>Assessment details:</b>	1 x Academic poster and presentation ~ 750 words and 5 minutes Controlled assessment - closed book ~ 1 hour		

This unit has 5 learning outcomes.

<b>LEARNING OUTCOMES</b>	<b>ASSESSMENT CRITERIA</b>
<b>The learner will:</b>	<b>The learner can:</b>
1 Understand the concept of the state of a substance.	1.1 Explain the state of a substance in relation to its melting point and boiling point.
2 Understand conduction, convection and radiation.	2.1 Explain the mechanisms of conduction, convection and radiation.
3 Understand specific heat capacity and latent heat.	3.1 Differentiate between temperature and heat including references to specific heat capacity and latent heat. 3.2 Accurately perform calculations involving heat transfer.
4 Understand the concepts of electro-magnetic fields.	4.1 Describe the properties of permanent magnets and sketch the lines of force around a) a wire carrying a current and b) a solenoid.
5 Understand electricity in terms of current, voltage and resistance.	5.1 Calculate voltage, currents and power for a network of resistors.

### Access to HE Diploma Unit

<b>Unit Code:</b>	QU026127		
<b>Title:</b>	Introduction to Computer Systems		
<b>Unit Level:</b>	Level 3	<b>Unit Credit:</b>	6
<b>Grading type:</b>	Graded		
<b>Grade Descriptors:</b>	<ul style="list-style-type: none"> <li>• GD1-Understanding the subject</li> <li>• GD3-Application of skills</li> <li>• GD7-Quality</li> </ul>		
<b>Academic subject content/other:</b>	Academic subject content		
<b>Assessment details:</b>	1 x Academic poster and presentation ~ 400 words and 5 mins Report ~ 1000 words Exam ~ 1.5 hours closed book		

This unit has 6 learning outcomes.

<b>LEARNING OUTCOMES</b>	<b>ASSESSMENT CRITERIA</b>
<b>The learner will:</b>	<b>The learner can:</b>
1. Understand the characteristics of computer hardware components	1.1 Describe and illustrate the five main components of a computer 1.2 Explain how these components are connected and communicate via data and address buses 1.3 Explain the flow of data to and from these components (fetch-decode-execute)
2. Understand the use of Input/Output devices.	2.1 Analyse a variety of I/O devices and their use for specific purposes.
3. Understand the function and range of storage media.	3.1 Evaluate the effectiveness of a range of storage media devices for specific purposes.
4. Understand how data is represented on a computer.	4.1 Explain how data is represented on a computer including: <ul style="list-style-type: none"> <li>• bits and bytes</li> <li>• different methods used to represent text, numeric and other information.</li> </ul>



LEARNING OUTCOMES	ASSESSMENT CRITERIA
<b>The learner will:</b>	<b>The learner can:</b>
5 Understand the start up procedures of a computer	5.1 Explain the role of the following in relation to a specific computer system: (a) BIOS routines (b) the POST procedure (c) the role of the CMOS RAM 5.2 Summarise the operating system files and the order in which they are loaded for a selected operating system. 5.3 Explain the role of Plug-and-Play in a selected operating system: <ul style="list-style-type: none"> <li>• at startup</li> <li>• whilst the system is in use.</li> </ul>
6 Understand computer specifications for a given purpose.	6.1 Explain how ports are used to connect external devices. 6.2 Where a choice of different types of port exists, justify the preference for one port over another. 6.3 Explain the function of three cards that could be used in a computer system. 6.4 Analyse when different cards might be chosen.

### Access to HE Diploma Unit

<b>Unit Code:</b>	QU016763		
<b>Title:</b>	Project Management		
<b>Unit Level:</b>	Level 3	<b>Unit Credit:</b>	3
<b>Grading type:</b>	Graded		
<b>Grade Descriptors:</b>	<ul style="list-style-type: none"> <li>• GD1-Understanding the subject</li> <li>• GD3-Application of skills</li> <li>• GD7-Quality</li> </ul>		
<b>Academic subject content/other:</b>	Academic subject content		
<b>Assessment details:</b>	Refer to assessment grid.		

This unit has 3 learning outcomes.

<b>LEARNING OUTCOMES</b>	<b>ASSESSMENT CRITERIA</b>
<b>The learner will:</b>	<b>The learner can:</b>
1 Understand why organisations use project management.	1.1 Analyse differences between routine and project work. 1.2 Analyse key elements of project work. 1.3 Evaluate the benefits of project management to an organisation.
2 Be able to plan projects.	2.1 Define clear goals for a project. 2.2 Justify project resource requirements. 2.3 Use project planning tools effectively. 2.4 Create a project schedule. 2.5 Evaluate project communication needs. 2.6 Assess potential risks to the successful completion of a project. 2.7 Explain actions to minimise risk.
3 Understand the importance of reviewing projects at all stages.	3.1 Analyse different methods used for monitoring projects. 3.2 Justify reasons for reviewing projects during and after completion.

### Access to HE Diploma Unit

<b>Unit Code:</b>	QU017117		
<b>Title:</b>	Structural Mechanics in Construction and Civil Engineering		
<b>Unit Level:</b>	Level 3	<b>Unit Credit:</b>	6
<b>Grading type:</b>	Graded		
<b>Grade Descriptors:</b>	<ul style="list-style-type: none"> <li>• GD1-Understanding the subject</li> <li>• GD3-Application of skills</li> <li>• GD7-Quality</li> </ul>		
<b>Academic subject content/other:</b>	Academic Subject Content		
<b>Assessment details:</b>	Practical project with a 1000 word report and containing mathematical and graphical calculations 1 x Academic poster and presentation ~ 500 words and 5 mins		

This unit has 3 learning outcomes.

<b>LEARNING OUTCOMES</b>	<b>ASSESSMENT CRITERIA</b>
<b>The learner will:</b>	<b>The learner can:</b>
1 Understand how structural elements behave under load.	1.1 Analyse the structural qualities and behaviour of materials used within construction.  This must include, as a minimum, steel, timber and concrete and may also include other materials such as plastics, glass and composites. 1.2 Analyse the behaviour of beams and columns under load.
<i>This includes:</i> <ul style="list-style-type: none"> <li>- Explaining the significance and relationship between shear force and bending moments.</li> <li>- Explaining the significance of the point of contraflexure.</li> </ul>	
2 Be able to solve structural mechanics problems.	2.1 Determine reactive forces and plot shear force and bending moment diagrams for: <ul style="list-style-type: none"> <li>a) a simply supported beam</li> <li>b) a cantilever beam.</li> </ul> 2.2 Determine the forces acting in a determinate frame, using mathematical and graphical techniques.

LEARNING OUTCOMES	ASSESSMENT CRITERIA
<b>The learner will:</b>	<b>The learner can:</b>
	2.3 Determine the maximum stress in a short column under axial and eccentric loads.
3 Be able to design structures	3.1 Produce suitable section sizes for: a) axially loaded columns b) simply supported beams subject to combined loading. 3.2 Evaluate the benefits of using computer software in structural analysis and design.

## Optional Graded Academic Units - Mathematics

### Access to HE Diploma Unit

<b>Unit Code:</b>	QU007967		
<b>Title:</b>	Calculus: Differentiation		
<b>Unit Level:</b>	Level 3	<b>Unit Credit:</b>	3
<b>Grading type:</b>	Graded		
<b>Grade Descriptors:</b>	<ul style="list-style-type: none"> <li>• GD2-Application of knowledge</li> <li>• GD3-Application of skills</li> <li>• GD7-Quality</li> </ul>		
<b>Academic subject content/other:</b>	Academic subject content		
<b>Assessment details:</b>	Refer to assessment grid		

This unit has 3 learning outcomes.

LEARNING OUTCOMES	ASSESSMENT CRITERIA
<b>The learner will:</b>	<b>The learner can:</b>
1 Understand differentiation of functions.	1.1 Differentiate a polynomial function. 1.2 Differentiate a trigonometric function. 1.3 Differentiate a logarithmic function. 1.4 Differentiate an exponential function. 1.5 Differentiate a product. 1.6 Differentiate a quotient. 1.7 Use the chain rule to differentiate a function.
2 Understand implicit differentiation and parametric equations.	2.1 Solve problems involving implicit differentiation. 2.2 Solve problems involving parametric equations.
3 Understand applications of differentiation.	3.1 Solve problems involving tangents and normal. 3.2 Solve problems involving stationary points. 3.3 Solve problems involving maxima and minima.

### Access to HE Diploma Unit

<b>Unit Code:</b>	QU007965		
<b>Title:</b>	Calculus: Integration		
<b>Unit Level:</b>	Level 3	<b>Unit Credit:</b>	3
<b>Grading type:</b>	Graded		
<b>Grade Descriptors:</b>	<ul style="list-style-type: none"> <li>• GD3-Application of skills</li> <li>• GD7-Quality</li> </ul>		
<b>Academic subject content/other:</b>	Academic subject content		
<b>Assessment details:</b>	Refer to assessment grid		

This unit has 3 learning outcomes.

LEARNING OUTCOMES	ASSESSMENT CRITERIA
<b>The learner will:</b>	<b>The learner can:</b>
1 Understand the integration of a function.	1.1 Integrate a polynomial function. 1.2 Integrate a trigonometric function. 1.3 Integrate a logarithmic function. 1.4 Integrate an exponential function. 1.5 Integrate a product using substitution. 1.6 Integrate a product by parts. 1.7 Integrate a fraction.
2 Understand integration in area and volume.	2.1 Solve problems involving area under a curve. 2.2 Solve problems involving volumes of revolution.
3 Understand differential equations.	3.1 Solve a first order differential equation. 3.2 Solve a second order differential equation.

### Access to HE Diploma Unit

<b>Unit Code:</b>	QU017259		
<b>Title:</b>	Geometry		
<b>Unit Level:</b>	Level 3	<b>Unit Credit:</b>	3
<b>Grading type:</b>	Graded		
<b>Grade Descriptors:</b>	<ul style="list-style-type: none"> <li>• GD3-Application of skills</li> <li>• GD7-Quality</li> </ul>		
<b>Academic subject content/other:</b>	Academic Subject Content		
<b>Assessment details:</b>	Refer to assessment grid		

This unit has 2 learning outcomes.

LEARNING OUTCOMES	ASSESSMENT CRITERIA
<b>The learner will:</b>	<b>The learner can:</b>
1 Understand coordinate geometry	1.1 Solve problems involving straight lines 1.2 Solve problems involving circles 1.3 Solve problems involving curves 1.4 Solve problems involving geometric transformations
2 Understand vectors	2.1 Solve problems involving vector arithmetic 2.2 Solve problems involving the Cartesian components of a vector 2.3 Solve problems involving the vector equation of a line 2.4 Solve problems involving the scalar product

### Access to HE Diploma Unit

<b>Unit Code:</b>	QU007424		
<b>Title:</b>	Mathematics: Algebra, Exponentials and Logarithms		
<b>Unit Level:</b>	Level 3	<b>Unit Credit:</b>	3
<b>Grading type:</b>	Graded		
<b>Grade Descriptors:</b>	<ul style="list-style-type: none"> <li>• GD3-Application of skills</li> <li>• GD5-Communication and presentation</li> <li>• GD7-Quality</li> </ul>		
<b>Academic subject content/other:</b>	Academic Subject Content		
<b>Assessment details:</b>	See assessment grid		

This unit has 5 learning outcomes.

<b>LEARNING OUTCOMES</b>	<b>ASSESSMENT CRITERIA</b>
<b>The learner will:</b>	<b>The learner can:</b>
1 Understand how to solve equations.	1.1 Solve simple linear equations involving brackets. 1.2 Solve quadratic equations using the formula.
2 Understand how to rearrange formulae.	2.1 Rearrange formulae involving sums, differences, products, quotients, brackets, powers and roots.
3 Understand how to use log laws.	3.1 Convert between exponential and logarithmic notation. 3.2 Use the product, quotient and power laws of logarithms and make calculations.
4 Understand how to transform to linear form.	4.1 Draw a straight line from data derived from a non-linear law, using logarithms where necessary.
5 Understand how to use exponential growth and decay.	5.1 Identify data which can be modelled by an exponential function. 5.2 Derive an exponential equation from given data and predict values.



### Access to HE Diploma Unit

<b>Unit Code:</b>	QU007941		
<b>Title:</b>	Matrices		
<b>Unit Level:</b>	Level 3	<b>Unit Credit:</b>	3
<b>Grading type:</b>	Graded		
<b>Grade Descriptors:</b>	<ul style="list-style-type: none"> <li>• GD2-Application of knowledge</li> <li>• GD3-Application of skills</li> <li>• GD7-Quality</li> </ul>		
<b>Academic subject content/other:</b>	Academic subject content		
<b>Assessment details:</b>	Refer to assessment grid		

This unit has 2 learning outcomes.

<b>LEARNING OUTCOMES</b>	<b>ASSESSMENT CRITERIA</b>
<b>The learner will:</b>	<b>The learner can:</b>
1 Understand determinants.	1.1 Evaluate a linear set of equations using Cramer's Rule. 1.2 Test that a set of equations is consistent. 1.3 Solve a given problem involving consistency of a set of equations. 1.4 Evaluate a determinant by using the properties of determinants.
2 Understand matrix operations.	2.1 Perform matrix arithmetic. 2.2 Calculate the inverse of a matrix. 2.3 Solve a set of linear equations using the determinant and inverse. 2.4 Use the Gauss elimination method to solve a given problem. 2.5 Determine the eigenvalues of a matrix. 2.6 Determine the eigenvectors of a matrix.

### Access to HE Diploma Unit

<b>Unit Code:</b>	QU007442		
<b>Title:</b>	Quantitative Methods - Statistics		
<b>Unit Level:</b>	Level 3	<b>Unit Credit:</b>	3
<b>Grading type:</b>	Graded		
<b>Grade Descriptors:</b>	<ul style="list-style-type: none"> <li>• GD3-Application of skills</li> <li>• GD4-Use of information</li> <li>• GD5-Communication and presentation</li> <li>• GD7-Quality</li> </ul>		
<b>Academic subject content/other:</b>	Academic subject content		
<b>Assessment details:</b>	See assessment grid		

This unit has 5 learning outcomes.

<b>LEARNING OUTCOMES</b>	<b>ASSESSMENT CRITERIA</b>
<b>The learner will:</b>	<b>The learner can:</b>
1 Be able to organise and present data.	1.1 Identify data as qualitative, quantitative, discrete or continuous. 1.2 Select the dominant features of data and suggest plausible interpretations. 1.3 Construct suitable charts and diagrams including histograms and line graphs with suitable scales, state the advantages and disadvantages of a wide range of diagrams.
2 Know how to calculate and use averages.	2.1 Calculate the mean, median and mode of grouped data. 2.2 Choose an appropriate average and justify the choice (e.g. Exam marks  - mean; Exam grades - median; qualitative data - mode.
3 Know how to calculate and use measures of spread.	3.1 Calculate standard deviation of raw data and grouped data. 3.2 Use mean and standard deviation to compare different data sets.
4 Be able to use bivariate data.	4.1 Calculate a coefficient of correlation (e.g. Spearman or Product moment). 4.2 Make statements about the possible causal relationship between variables with strong correlation.

LEARNING OUTCOMES	ASSESSMENT CRITERIA
<b>The learner will:</b>	<b>The learner can:</b>
5 Be able to calculate probability.	5.1 Calculate the probability of combined events. 5.2 Construct tree diagrams and use them to solve problems involving combined events. 5.3 Identify events which are independent or mutually exclusive.

**Access to HE Diploma Unit**

<b>Unit Code:</b>	QU007957		
<b>Title:</b>	Series		
<b>Unit Level:</b>	Level 3	<b>Unit Credit:</b>	3
<b>Grading type:</b>	Graded		
<b>Grade Descriptors:</b>	<ul style="list-style-type: none"> <li>• GD2-Application of knowledge</li> <li>• GD3-Application of skills</li> <li>• GD7-Quality</li> </ul>		
<b>Academic subject content/other:</b>	Academic subject content		
<b>Assessment details:</b>	Refer to assessment grid		

This unit has 3 learning outcomes.

<b>LEARNING OUTCOMES</b>	<b>ASSESSMENT CRITERIA</b>
<b>The learner will:</b>	<b>The learner can:</b>
1 Understand arithmetic progressions.	1.1 Find the sum of an arithmetic progression given the first and last terms. 1.2 Find the sum of an arithmetic progression given the first term, the common difference and the number of items. 1.3 Solve problems involving arithmetic progressions. 1.4 Solve problems involving arithmetic mean.
2 Understand geometric progressions.	2.1 Find the sum of a geometric progression given the first term, the common ratio and the number of terms. 2.2 Find the sum to infinity of a geometric series. 2.3 Solve problems involving geometric progressions. 2.4 Solve problems involving geometric mean.
3 Understand series.	3.1 Determine whether a series is convergent or divergent. 3.2 Use Maclaurin series to approximate function. 3.3 Prove a series expression.



## Mandatory Units: Ungraded

### Access to HE Diploma Unit

<b>Unit Code:</b>	QU007486		
<b>Title:</b>	Application of Number - Interpreting and Presenting Information		
<b>Unit Level:</b>	Level 3	<b>Unit Credit:</b>	3
<b>Grading type:</b>	Ungraded		
<b>Academic subject content/other:</b>	Academic Subject Content		
<b>Assessment details:</b>	2 x controlled assessments ~ 2 x 1 hour assessments		

This unit has 2 learning outcomes.

LEARNING OUTCOMES	ASSESSMENT CRITERIA
<b>The learner will:</b>	<b>The learner can:</b>
1 Know how to obtain and interpret mathematical and statistical information.	1.1 Within a complex task, identify and evaluate possible sources of data, e.g. rate of change, trends, probabilities. 1.2 Justify the choice of data collection procedures giving reasons for choosing a particular sample and methods used. 1.3 Evaluate actual or possible sources of error in collecting and recording data. 1.4 Choose and justify the chosen methods of recording data. 1.5 Interpret the main characteristics of the data in relation to the task.
2 Be able to present mathematical and statistical data.	2.1 Choose and use a range of appropriate and effective techniques to present accurately, e.g. the use of probability to describe situations, the presentation and interpretation of upper and lower boundaries of results; statistical diagrams. 2.2 Use correct axes, scales and conversions. 2.3 Justify choice and use of presentation techniques and methods for the original purpose of the task.

### Access to HE Diploma Unit

<b>Unit Code:</b>	QU010772		
<b>Title:</b>	Practical Science Skills		
<b>Unit Level:</b>	Level 3	<b>Unit Credit:</b>	3
<b>Grading type:</b>	Ungraded		
<b>Academic subject content/other:</b>	Academic Subject Content		
<b>Assessment details:</b>	See assessment grid		

This unit has 4 learning outcomes.

<b>LEARNING OUTCOMES</b>	<b>ASSESSMENT CRITERIA</b>
<b>The learner will:</b>	<b>The learner can:</b>
1 Be able to use a range of general laboratory equipment.	1.1 Demonstrate how to use equipment safely and effectively within a laboratory.
2 Be able to use specialised equipment in a laboratory.	2.1 Demonstrate how to carry out a scientific procedure with accuracy.
3 Know how to work with appropriate regard for safety.	3.1 Demonstrate how to carry out practical science work in a safe manner. 3.2 Assess the possible safety issues relating to a practical scientific procedure.
4 Understand how to report on scientific investigations.	4.1 Produce an experimental report with use of appropriate scientific terminology. 4.2 Identify a range of ways in which the work could be improved. 4.3 Evaluate the outcomes of the original objective, identifying further steps to be taken in the development of work.

### Access to HE Diploma Unit

<b>Unit Code:</b>	QU025532		
<b>Title:</b>	Preparation for Higher Education		
<b>Unit Level:</b>	Level 3	<b>Unit Credit:</b>	3
<b>Grading type:</b>	Ungraded		
<b>Academic subject content/other:</b>	Other		
<b>Assessment details:</b>	Refer to assessment grid.		

This unit has 4 learning outcomes.

<b>LEARNING OUTCOMES</b>	<b>ASSESSMENT CRITERIA</b>
<b>The learner will:</b>	<b>The learner can:</b>
1 Understand how to identify opportunities for Higher Education.	1.1 Use information sources to research Higher Education courses. 1.2 Analyse processes and procedures necessary to gain entry to Higher Education. 1.3 Analyse information on Higher Education courses and make appropriate realistic choices.
2 Understand the process of completing a Higher Education application form.	2.1 Complete an application form with excellent attention to detail, meeting a given deadline. 2.2 Summarise and evaluate personal experiences, achievement and goals, communicating these clearly in a personal statement.
3 Understand preparation required for the interview process.	3.1 Conduct further personal research into courses at relevant institutions in preparation for an interview. 3.2 Prepare provisional answers to anticipated questions, making excellent use of previous experience and recent study.
4 Understand the need to prepare for the transition to Higher Education.	4.1 Analyse the personal and academic qualities needed for successful study in Higher Education. 4.2 Explain likely practical problems and barriers in moving to higher education and seek strategies for overcoming these.



LEARNING OUTCOMES	ASSESSMENT CRITERIA
The learner will:	The learner can:
	4.3 Analyse the nature of study in Higher Education.

## Optional Units: Ungraded

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### Access to HE Diploma Unit

<b>Unit Code:</b>	QU026150		
<b>Title:</b>	Computer Data Protection		
<b>Unit Level:</b>	Level 3	<b>Unit Credit:</b>	3
<b>Grading type:</b>	Ungraded		
<b>Academic subject content/other:</b>	Academic subject content		
<b>Assessment details:</b>	Structured questions ~ 750 words Case study analysis ~ 750 words		

This unit has 2 learning outcomes.

<b>LEARNING OUTCOMES</b>	<b>ASSESSMENT CRITERIA</b>
<b>The learner will:</b>	<b>The learner can:</b>
1 Understand current UK legislation relating to the use and protection of data.	1.1 Explain the purpose of legislation related to data protection. 1.2 Evaluate current legislation relating to the use and protection of data when using computers. 1.3 Analyse examples of the application of current data protection legislation.
2 Understand the need for control of data to ensure that it is accurate and secure.	2.1 Evaluate the need for control of data to ensure that it is accurate and secure. 2.2 Use examples to examine when data should or should not be controlled.

### Access to HE Diploma Unit

<b>Unit Code:</b>	QU029027		
<b>Title:</b>	Introduction to Computer Programming		
<b>Unit Level:</b>	Level 3	<b>Unit Credit:</b>	3
<b>Grading type:</b>	Ungraded		
<b>Academic subject content/other:</b>	Academic Subject Content		
<b>Assessment details:</b>	2 x computer programmes with development diary ~ 2 x programmes with 500 word development diary		

This unit has 2 learning outcomes.

<b>LEARNING OUTCOMES</b>	<b>ASSESSMENT CRITERIA</b>
<b>The learner will:</b>	<b>The learner can:</b>
1 Be able to implement simple programs.	1.1 Declare and use meaningful variables and constants. 1.2 Declare appropriate simple data types. 1.3 Use meaningful identifiers. 1.4 Write programs including arithmetic and simple input and formatted output statements. 1.5 Use spaces, blank lines and indentation to make program easier to read and understand.
2 Be able to use program control structures.	2.1 Select appropriate relational operators. 2.2 Use two selection statements. 2.3 Use three iteration statements.

### Access to HE Diploma Unit

<b>Unit Code:</b>	QU025280		
<b>Title:</b>	Optimising Examination Performance		
<b>Unit Level:</b>	Level 3	<b>Unit Credit:</b>	3
<b>Grading type:</b>	Ungraded		
<b>Academic subject content/other:</b>	Other		
<b>Assessment details:</b>	Examination preparation plan ~ 500 words Examination paper from another unit ~ 1-2 hours Reflective journal ~ 800 words		

This unit has 4 learning outcomes.

<b>LEARNING OUTCOMES</b>	<b>ASSESSMENT CRITERIA</b>
<b>The learner will:</b>	<b>The learner can:</b>
1 Be able to effectively prepare for an examination.	1.1 Produce an effective and realistic preparation plan. 1.2 Identify priorities in the preparation plan. 1.3 Reflect on the plan's effectiveness to identify future improvements.
2 Be able to complete competent answers, which demonstrate subject knowledge.	2.1 Follow all instructions accurately to complete the correct number and combination of questions. 2.2 Include the salient aspects in answers, with the accuracy and detail required by the subject. 2.3 Show in answers an in-depth understanding of the issues / arguments/problems, as required by the subject. 2.4 Apply knowledge or learning coherently in support of arguments and/or to resolve problems.
3 Understand how to minimise common examination pitfalls.	3.1 Identify common pitfalls in examination performance. 3.2 Evaluate potential strategies to avoid examination pitfalls.
4 Know how to minimise stress to enhance examination performance.	4.1 Recognise own stressors. 4.2 Develop strategies to minimise own stressors.

### Access to HE Diploma Unit

<b>Unit Code:</b>	QU025450		
<b>Title:</b>	Presenting Information Using ICT		
<b>Unit Level:</b>	Level 2	<b>Unit Credit:</b>	3
<b>Grading type:</b>	Ungraded		
<b>Academic subject content/other:</b>	Other		
<b>Assessment details:</b>	Notes from a range of sources ~ 300 words Presentation ~ 200 words Presentation lecture notes and handouts ~ 1,000 words		

This unit has 5 learning outcomes.

<b>LEARNING OUTCOMES</b>	<b>ASSESSMENT CRITERIA</b>
<b>The learner will:</b>	<b>The learner can:</b>
1. Know how to combine text and other types of information to create a presentation using presentation software.	1.1 Create a presentation using presentation software. 1.2 Use built-in slide layouts to present different information effectively. 1.3 Apply a design template to a presentation appropriate for the audience. 1.4 Combine text, images, charts to present information.
2. Know how to use tools within the presentation software to edit and enhance the presentation.	2.1 Present information in a way that is appropriate for the audience of the presentation by: <ul style="list-style-type: none"> <li>• formatting text</li> <li>• creating and formatting tables</li> <li>• creating and editing charts.</li> </ul> 2.2 Format images and drawn objects to enhance the presentation. 2.3 Use animation and transition effects appropriate for the audience.
3. Understand factors that affect the effective communication of information whilst using presentation software.	3.1 Recognise copyright and constraints which may affect the presentation and its content. 3.2 Describe how to deliver the presentation to meet the needs of the audience and communicate effectively.

LEARNING OUTCOMES	ASSESSMENT CRITERIA
<b>The learner will:</b>	<b>The learner can:</b>
4. Review the presentation.	4.1 Check timings, spelling, transitions and make any necessary corrections to ensure that the presentation is fit for purpose.
5. Be able to deliver a completed presentation to an audience.	5.1 Produce a commentary for the slide presentation. 5.2 Produce handouts, lecture notes and prints of the slideshow as required. 5.3 Deliver the presentation. 5.4 Identify how to improve presentations for the future.

### Access to HE Diploma Unit

<b>Unit Code:</b>	QU028487		
<b>Title:</b>	Promoting Wellbeing and Building Resilience		
<b>Unit Level:</b>	Level 3	<b>Unit Credit:</b>	3
<b>Grading type:</b>	Ungraded		
<b>Academic subject content/other:</b>	Other		
<b>Assessment details:</b>	Report ~ 1500 words		

This unit has 4 learning outcomes.

<b>LEARNING OUTCOMES</b>	<b>ASSESSMENT CRITERIA</b>
<b>The learner will:</b>	<b>The learner can:</b>
1. Understand the physical and psychological impact of pressure and stress on mental wellbeing.	1.1 Explain the physical and psychological impact of pressure and stress on mental wellbeing.
2. Understand the connection between mental wellbeing and resilience.	2.1 Analyse the connection between mental wellbeing and resilience.
3. Understand the factors that can improve wellbeing and build resilience.	3.1 Explain factors that can improve wellbeing. 3.2 Explain factors that can negatively affect wellbeing and how to avoid them. 3.3 Explain the behaviours associated with resilience. 3.4 Explain ways to build resilience.
4. Understand how to manage an individual's mental wellbeing and the support available to them.	4.1 Evaluate the methods for managing and maintaining mental wellbeing and building resilience.  To include practical and theoretical methods such as breathing exercises to reduce stress, mindfulness techniques. 4.2 Analyse the types of support available from different sources.

### Access to HE Diploma Unit

<b>Unit Code:</b>	QU026344		
<b>Title:</b>	References and Reliability of Sources		
<b>Unit Level:</b>	Level 3	<b>Unit Credit:</b>	3
<b>Grading type:</b>	Ungraded		
<b>Academic subject content/other:</b>	Other		
<b>Assessment details:</b>	Literature review 1500 words including recognised form of referencing and bibliography		

This unit has 3 learning outcomes.

<b>LEARNING OUTCOMES</b>	<b>ASSESSMENT CRITERIA</b>
<b>The learner will:</b>	<b>The learner can:</b>
1 Understand the difference between primary and secondary sources.	1.1 Evaluate the difference between primary and secondary sources.
2 Understand the value of a variety of primary source materials as evidence.	2.1 Analyse primary sources for a specific context. 2.2 Evaluate the primary sources, taking into account: authorship, purpose, audience, and underlying values and beliefs.
3 Understand the uses and limitations of secondary sources.	3.1 Compare and evaluate secondary sources considering the following: use of sources, 'facts', background material, interpretation.



### Access to HE Diploma Unit

<b>Unit Code:</b>	QU011467		
<b>Title:</b>	Spreadsheets		
<b>Unit Level:</b>	Level 3	<b>Unit Credit:</b>	3
<b>Grading type:</b>	Ungraded		
<b>Academic subject content/other:</b>	Other		
<b>Assessment details:</b>	Please refer to assessment grid.		

This unit has 7 learning outcomes.

LEARNING OUTCOMES	ASSESSMENT CRITERIA
The learner will:	The learner can:
1 Know how to design and store a spreadsheet.	1.1 Design a spreadsheet appropriate to a user's requirements. 1.2 Create and store the spreadsheet. 1.3 Evaluate the spreadsheet in terms of meeting the user's needs.
2 Be able to retrieve and modify an existing spreadsheet.	2.1 Modify the spreadsheet design/content in response to user feedback.
3 Know how to print a spreadsheet.	3.1 Print or display whole or part spreadsheets/formulae with a variety of print layout options.
4 Be able to enhance user readability.	4.1 Use suitable formatting options for displaying text and numeric values.
5 Understand spreadsheet functions.	5.1 Develop a spreadsheet solution using a range of mathematical functions.
6 Understand graphical facilities.	6.1 Use an appropriate graph type. 6.2 Draw pie, bar, line graphs with appropriate labels attached.
7 Know how to use additional features within the spreadsheet environment.	7.1 Use advanced sorting, protecting and filtering facilities on a spreadsheet. 7.2 Analyse data using pivot tables.

### Access to HE Diploma Unit

<b>Title:</b>	Sustainability Project		
<b>Unit Code:</b>	QU033854		
<b>Unit Level:</b>	Level 3	<b>Unit Credit:</b>	3
<b>Grading type:</b>	Ungraded		
<b>Academic subject content/other:</b>	Academic subject content		
<b>Suggested Assessment details:</b>	Report, including project plan and reflection – 1,000 words		

This unit has 3 learning outcomes.

<b>LEARNING OUTCOMES</b>	<b>ASSESSMENT CRITERIA</b>
<b>The learner will:</b>	<b>The learner can:</b>
1. Be able to plan a project to promote sustainability within a specific sector.	1.1 Identify a project to promote sustainability within a chosen sector, justifying your choice. Produce a project plan for own project including: <ul style="list-style-type: none"> <li>• Aims and objectives</li> <li>• Time scales</li> <li>• Methods</li> <li>• Resources required</li> <li>• Any health and safety considerations.</li> </ul> 1.2
2. Be able to carry out a sustainability project.	2.1 Carry out a sustainability project. 2.2 Produce a report on the findings of the sustainability project.
3. Be able to review the success of a sustainability project.	3.1 Evaluate the extent to which the project has met the aim and objectives. 3.2 Evaluate the extent to which the project has met the aim and objectives.

### Access to HE Diploma Unit

<b>Title:</b>	The Fundamentals of Environmental Sustainability		
<b>Unit Code:</b>	QU033880		
<b>Unit Level:</b>	Level 3	<b>Unit Credit:</b>	3
<b>Grading type:</b>	Ungraded		
<b>Academic subject content/other:</b>	Academic subject content		
<b>Suggested Assessment details:</b>	Report – 1500 words		

This unit has 4 learning outcomes.

<b>LEARNING OUTCOMES</b>	<b>ASSESSMENT CRITERIA</b>
<b>The learner will:</b>	<b>The learner can:</b>
1. Know the importance of sustainability within a specific sector.	1.1 Explain what is meant by sustainability. Explain the importance of supporting environmental sustainability within a chosen sector. 1.2 Explain environmental sustainability within a chosen sector.
2. Know how environmental sustainability can be supported within the chosen sector.	2.1 Describe environmental issues relevant to a chosen sector. 2.2 Describe the impact of the chosen sector on the environment. 2.3 Explain how these environmental issues could be minimised within a chosen sector. 2.4 Analyse factors to consider when working towards environmental sustainability in a chosen sector.
3. Know how the 3 Rs of sustainability can be applied within the chosen sector.	3.1 Explain the 3 Rs of sustainability. 3.2 Analyse ways that a chosen sector can implement the 3 Rs of sustainability.
4. Understand the importance of waste management within the chosen sector.	4.1 Explain the importance of having a waste management strategy within a chosen sector. 4.2 Explain environmental hazards or risks that could be caused by poor waste management within a chosen sector.

### Access to HE Diploma Unit

<b>Unit Code:</b>	QU026155		
<b>Title:</b>	Writing reports		
<b>Unit Level:</b>	Level 3	<b>Unit Credit:</b>	3
<b>Grading type:</b>	Ungraded		
<b>Academic subject content/other:</b>	Other		
<b>Assessment details:</b>	Report plan ~ Plan Presentation of report plan ~ 2-3 Minutes Report ~ 1000 words		

This unit has 5 learning outcomes.

<b>LEARNING OUTCOMES</b>	<b>ASSESSMENT CRITERIA</b>
<b>The learner will:</b>	<b>The learner can:</b>
1 Understand the significance of the report title in determining the content.	1.1 Analyse the requirements of the question or task. 1.2 Analyse the main points which must be covered, omitting irrelevant detail.
2 Be able to plan and present the plan for a report	2.1 Produce a plan for a report. 2.2 Present the plan for the report.
3 Be able to structure a report.	3.1 Produce an introduction which sets out how the subject will be dealt with in the report. 3.2 Use evidence and examples to strengthen information provided in the report. 3.3 Use linking sentences in paragraphs to produce a cohesive report. 3.4 Provide a conclusion which sums up the main findings of the report.
4 Be able to write in an appropriate style.	4.1 Write in a detached, balanced, and objective manner. 4.2 Write formal English avoiding emotive language and colloquialisms.
5 Know the conventions for acknowledging sources.	5.1 Acknowledge the work of other authors both during the report and in a list of references. 5.2 Use recognised approaches for acknowledging sources.

## 7. What to do next

For existing centres please contact your named Development Manager or Development Officer.

For organisations, not yet registered as a Gateway Qualifications centre please contact:

Tel: 01206 911211

Email: [enquiries@gatewayqualifications.org.uk](mailto:enquiries@gatewayqualifications.org.uk)

## 8. Gateway Qualifications

Gateway Qualifications, a not for profit registered charity, is an Awarding Organisation and authorised Access Validating Agency based in Colchester. We work with learning providers and industry experts to design and develop qualifications that benefit the learner and the employer.

We support flexible, responsive and quality assured learning opportunities whether it's in the classroom, at work, in the community or through distance learning.

We are recognised by Ofqual, to design, develop and submit qualifications to the Regulated Qualifications Framework (RQF) and by the Quality Assurance Agency for the development and approval of Access to Higher Education Diplomas.

