



Group Award Specification for:

**HNC Computer Aided Draughting and Design
(SCQF level 7)**

Group Award Code: GL57 15

**HND Computer Aided Draughting and Design
(SCQF level 8)**

Group Award Code: GL5A 16

**PDA Computer Aided Draughting and Design
(SCQF level 7)**

Group Award Code: GL5C 47

Validation date: 24 May 2015

Date of original publication: June 2016

Version: 01

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1 Introduction

This document was previously known as the Arrangements document. The purpose of this document is to:

- ◆ assist centres to implement, deliver and manage the qualification
- ◆ provide a guide for new staff involved in offering the qualification
- ◆ inform course managers teaching staff, assessors, learners, employers and HEIs of the aims and purpose of the qualification
- ◆ provide details of the range of learners the qualification is suitable for and progression opportunities

This is the Group Award Specification for the HNC, HND and PDA Computer Aided Draughting and Design.

The HNC and HND Computer Aided Draughting and Design Award were first validated in 1994 and subsequently went through a major review in 2006/2007. The PDA Computer Aided Draughting and Design was validated in 2007. Since 2006/2007 over 1000 learners have achieved this award and progressed onto university or into employment. In 2014/2015, a further review of the qualifications took place. The Qualifications Development Team engaged with all stakeholders, industry, colleges, higher education establishments, professional lead bodies and existing learners to ensure a full and detailed review was established and achieved. The outcome of the review identified Units within the framework that were in need of minor updates and new Units which should be added and would be beneficial to the framework by meeting the needs of employers and the learners alike. This document covers the revised qualifications and is reflective of the findings of the detailed research that was undertaken during the review process.

The HNC and HND could be delivered on a full-time, part-time or day/block release basis. The PDA qualification is by the nature of the framework considered to be a part time course that would be suitable for day/block release or evening delivery.

The qualifications are aimed at learners wishing to pursue a career working in the engineering, manufacturing and construction sectors, or wishing to upgrade and/or broaden their existing skills set. This could include:

- School leavers
- Learners studying related subject areas such as engineering, construction and design related disciplines at NC level
- Adult returners to education
- Learners in employment who wish to enhance their career prospects
- People changing direction/seeking a career change
- Part-time learners wishing to broaden skills and knowledge

Learners who study towards these qualifications could progress into industry as CAD Technicians or Junior Designers, working across a range of engineering and construction disciplines. Former learners have successfully progressed to work in the aeronautical, oil and gas, ship building, manufacturing and construction sectors.

Learners studying towards these qualifications may seek to become student members of the Institution of Engineering Designers (IED). On completion of the qualification learners may choose to apply for full membership and progress towards Engineering Technician, Incorporated Engineer or Chartered Engineer status. This process would be the responsibility of the individual learner and successful application would be at the discretion of the IED. SQA centres delivering these awards may choose to apply to become an accredited IED Centre for the HND qualification. This process is on a centre by centre basis and accreditation is at the discretion of the IED.

2 Qualifications structure

2.1 Structure – HNC Computer Aided Draughting and Design

This HNC Group Award is made up of 12 SQA Unit credits. It comprises 96 SCQF credit points of which 64 are at SCQF level 7 in the mandatory section including a Graded Unit of 8 SCQF credit points at SCQF level 7.

NOTE: if the Unit HE62 33 — *Autodesk Certified User: AutoCAD* is selected then the total SCQF points at level 7 within the mandatory section will be 56 and 8 at SCQF level 6. The remaining 32 SCQF credit points required for the Group Award are to be selected from the optional section. A mapping of Core Skills development opportunities is available in Section 5.3.

4 code	2 code	Unit title	SCQF level	SCQF credit points	SQA credit
Mandatory Units					
H7MB	34	Communication: Practical Skills	7	8	1
DW1E or HE62	34 33	CAD: 2D I Autodesk Certified User: AutoCAD	7 6	8 8	1 1
HE27	34	CAD: 3D Surface and Solid Modelling	7	16	2
HE28	34	CAD: User Systems	7	8	1
DW16	34	CAD: Principles	7	8	1
DW17	34	Design Methodology	7	8	1
HE69	34	Computer Aided Draughting and Design: Graded Unit 1	7	8	1
Optional Units: 4 SQA Unit credits required (32 SCQF credit points)					
Group A: 3 to 4 SQA Unit credits required					
DW12	34	CAD: 2D II	7	8	1
DW18	34	CAD: Visualisation, Rendering and Presentation	7	8	1
DW19 or HE63	34 33	CAD: Feature-Based Modelling 1 Autodesk Certified User: Inventor	7 6	8 8	1 1
HE2C	35	CAD: Systems Management	8	8	1
DW1C	34	CAD: Graphical Design	7	8	1
DW1D or HE66	34 33	CAD: Architectural 1 Autodesk Certified User: Revit	7 6	8 8	1 1
F32A	34	Architectural CADT: Principles and Practice	7	16	2

4 code	2 code	Unit title	SCQF level	SCQF credit points	SQA credit
Optional Units: (cont)					
Group A: (cont)					
F329	34	Architectural CADT: Residential Design	7	16	2
F8LW	34	CADD Skills	7	16	2
HE2D	34	CAD: Cloud Technologies	7	8	1
HE29	34	CAD: 3D Printing and Scanning	7	8	1
HE2A	34	CAD: Drawing Office Practice	7	8	1
HE2H	35	CAD: Digital Collaboration Practices	8	16	2
Group B: 0 to 1 SQA Unit credit required					
DR3M	35	Design For Manufacture	8	8	1
H7K0	33	Engineering Mathematics 1	6	8	1
H7K1	34	Engineering Mathematics 2	7	8	1
DT46	34	Materials Selection	7	8	1
DR3L	34	Engineering Principles	7	8	1
DE3R	34	Personal Development Planning	7	8	1
H8T2	33	Workplace Communication in English	6	8	1

2.2 Structure — HND Computer Aided Draughting and Design

This HND Group Award is made up of 30 SQA Unit credits. It comprises 240 SCQF credit points of which 80 are at SCQF level 7 and 88 are at SCQF level 8 in the mandatory section, this includes a Graded Unit of 8 SCQF credit points at SCQF level 7 and a Graded Unit of 16 SCQF credit points at SCQF level 8.

NOTE: if the Units HE62 33 — *Autodesk Certified User: AutoCAD*, HE63 33 *Autodesk Certified User: Inventor* are selected then the total SCQF points at level 7 within the mandatory section will be 64 and 16 at SCQF level 6. The remaining 72 SCQF credit points required for the Group Award are to be selected from the optional section. A mapping of Core Skills development opportunities is available in Section 5.3.

4 code	2 code	Unit title	SCQF level	SCQF credit points	SQA credit
Mandatory Units					
H7MB	34	Communication: Practical Skills	7	8	1
DW1E or HE62	34 33	CAD: 2D I Autodesk Certified User: AutoCAD	7 6	8 8	1 1
HE27	34	CAD: 3D Surface and Solid Modelling	7	16	2
HE28	34	CAD: User Systems	7	8	1
DW16	34	CAD: Principles	7	8	1
DW17	34	Design Methodology	7	8	1
DW18	34	CAD: Visualisation, Rendering and Presentation	7	8	1
DW19 or HE63	34 33	CAD: Feature-Based Modelling 1 Autodesk Certified User: Inventor	7 6	8 8	1 1
HE69	34	Computer Aided Draughting and Design: Graded Unit 1	7	8	1
F214	35	CAD: 3D Animation	8	16	2
F217 or HE65	35 35	CAD: Feature Based Modelling 2 Autodesk Certified Professional: Inventor	8 8	16 16	2 2
F218	35	CAD: Manufacturing	8	16	2
F219	35	CAD: Prototyping	8	16	2
D76J	35	Project Management	8	8	1
HE6A	35	Computer Aided Draughting and Design: Graded Unit 2	8	16	2
Optional Units 9 SQA Unit credits required (72 SCQF credit points)					
Group A: 7 to 9 SQA Unit credits required					
DW12	34	CAD: 2D II	7	8	1
F215	35	CAD: Analysis	8	8	1
F213	35	CAD: Technical Illustration	8	16	2
F21A	35	CAD: Sheet Metal	8	8	1
HE2C	35	CAD: Systems Management	8	8	1
DW1C	34	CAD: Graphical Design	7	8	1
F216	35	CAD: Customised Programming	8	16	2

Optional Units: (cont)					
Group A: (cont)					
4 code	2 code	Unit title	SCQF level	SCQF credit points	SQA credit
DW1D or HE66	34	CAD: Architectural 1	7	8	1
F32A	33	Autodesk Certified User: Revit	6	8	1
F32A	34	Architectural CADT: Principles and Practice	7	16	2
F329	34	Architectural CADT: Residential Design	7	16	2
F8LW	34	CADD Skills	7	16	2
HE2D	34	CAD: Cloud Technologies	7	8	1
HE29	34	CAD: 3D Printing and Scanning	7	8	1
HE2A	34	CAD: Drawing Office Practice	7	8	1
HE2H	35	CAD: Digital Collaboration Practices	8	16	2
HE68	35	Autodesk Certified Professional: AutoCAD	8	16	2
Group B: 1 to 2 SQA Unit credits required					
DR3M	35	Design For Manufacture	8	8	1
H7K0	33	Engineering Mathematics 1	6	8	1
H7K1	34	Engineering Mathematics 2	7	8	1
DT46	34	Materials Selection	7	8	1
DR3L	34	Engineering Principles	7	8	1
DE3R	34	Personal Development Planning	7	8	1
H8T2	33	Workplace Communication in English	6	8	1

2.3 Structure – PDA Computer Aided Draughting and Design

This Group Award is made up of 6 SQA Unit credits. It comprises 48 SCQF credit points of which 32 are at SCQF level 7 in the mandatory section.

NOTE: if the Unit HE62 33 — *Autodesk Certified User: AutoCAD* is selected then the total SCQF points at level 7 within the mandatory section will be 24 and 8 at SCQF level 6. The remaining 16 SCQF credit points required for the Group Award are to be selected from the optional section. A mapping of Core Skills development opportunities is available in Section 5.3.

4 code	2 code	Unit title	SCQF level	SCQF credit points	SQA credit
Mandatory Units					
DW1E or HE62	34 33	CAD: 2D I Autodesk Certified User: AutoCAD	7 6	8 8	1 1
HE27	34	CAD: 3D Surface and Solid Modelling	7	16	2
DW16	34	CAD: Principles	7	8	1
Optional Units: 2 SQA Unit credits required (16 SCQF credit points)					
DW12	34	CAD: 2D II	7	8	1
DW18	34	CAD: Visualisation, Rendering and Presentation	7	8	1
DW19 or HE63	34 33	CAD: Feature-Based Modelling 1 Autodesk Certified User: Inventor	7 6	8 8	1 1
DW1D or HE66	34 33	CAD: Architectural 1 Autodesk Certified User: Revit	7 6	8 8	1 1
DW1C	34	CAD: Graphical Design	7	8	1

3 Aims of the qualifications

The main aim of the PDA, HNC and HND Computer Aided Draughting and Design Group Awards are to provide learners with the opportunity to develop current and future CAD skills matching the needs of industry that includes engineering, manufacturing and construction. Learners who are studying the HNC, HND or PDA awards will also develop knowledge and understanding of the design process and the stages of design where CAD can be utilised in the achievement of a desirable design solution within the engineering sector.

In addition, the awards are tailored to provide learners with opportunities to gain knowledge and skills sets appropriate to more formal recognition and to provide pathways to professional status.

The aims of the Group Awards have been split into general aims and specific aims.

3.1 General aims of the qualifications

- 1 To provide opportunities for learners to develop competences required by employers across the range of employment situations, including full-time, part-time or freelance work.
- 2 To make available the opportunity for learners to develop knowledge and skills for the purpose of progression to further academic or professional qualifications, either before embarking on a career, or parallel to it.
- 3 To develop key skills for employability while building on previously acquired transferable skills which that could allow progression within the SCQF (Scottish Credit and Qualification Framework) or lead to employment.
- 4 To develop skills in study, research, analysis, and improve learner's ability to define and solve problems.
- 5 To develop the learner's ability to be flexible and work cooperatively with others.
- 6 To develop the learner's responsibility for their own learning.

3.2 Specific aims of the qualifications

- 7 To enable learners to enter employment as CAD technicians, Junior Designers and Designers within the engineering, manufacturing and construction sectors.
- 8 To deliver an award that provides an opportunity for learners to achieve appropriate professional body recognition, in particular but not exclusively, the Institution of Engineering Designers, initially as student member with potential to progress to full membership and either Eng Tech, IEng or CEng recognition.
- 9 To provide learners with a range of contemporary vocational skills in the preparation, co-ordination and communication of technical information, that includes:
 - ◆ Production of drawings to industry and current international standards
 - ◆ Creation of graphical information
 - ◆ Preparation of reports and schedules (Applicable to HNC and HND only)
 - ◆ Obtaining, recording and organising technical information
 - ◆ Creation and manipulation of 3D CAD models
 - ◆ Management of design projects using traditional and emerging technologies (Applicable to HNC and HND only)

- 10 To develop knowledge, understanding and skills in a range of core Computer Aided Draughting topics up to SCQF level 7 for PDA and HNC and up to SCQF level 8 for the HND qualification.
- 11 To provide an award that, on successful completion, will allow learners to progress to appropriate degree level programmes.
- 12 To develop a degree of specialisation within subject specific disciplines.
- 13 To provide an opportunity to achieve industry recognised vendor qualifications.

3.3 Graded Units

There are two Graded Units included within the HNC and HND awards:

Computer Aided Draughting and Design: Graded Unit 1

1 SQA Unit credit 8 SCQF points at SCQF level 7

Computer Aided Draughting and Design: Graded Unit 2

2 SQA Unit credits 16 SCQF points at SCQF level 8

Both *Graded Unit 1 and 2* are project based and are designed to test the knowledge and skills across the Units of the qualification within a context reflective of industry practice. The tasks are designed to assess the knowledge and skills gained from studying the mandatory Units within the framework. Learners are challenged to demonstrate that they can recall, apply and integrate the knowledge and skills gained during their studies.

Graded Unit 2, delivered in Year 2 of the HND qualification will be broader and deeper in the assessment of knowledge and skills across the Units of the qualification.

Further to the development of technical knowledge and skills assessed in the Graded Units, the learners through the tasks set will further enhance and develop essential skills and attributes that are deemed desirable for employment. These essential skills should include, planning and organising, working to deadlines and time management.

4 Recommended entry to the qualifications

Entry to this qualification is at the discretion of the centre. The following information on prior knowledge, skills, experience or qualifications that provide suitable preparation for this qualification has been provided by the Qualification Design Team as guidance only.

Learners would benefit from having attained the skills, knowledge and understanding required by one or more of the following or equivalent qualifications and/or experience:

Formal Qualifications considered suitable for access to PDA, HNC or HND Year 1

Learners who enter with at least one of the following qualifications are likely to benefit more readily from the programme:

- ◆ NC or HNC in a related discipline, these could include but not limited to the NC Computer Aided Design and Technology, NC in an Engineering discipline, NC Built Environment, HNC Mechanical Engineering, HNC Manufacturing Engineering or HNC Fabrication and Welding Engineering.
- ◆ at least one Higher level pass, with appropriate supporting passes at Standard Grade Credit/National 5 or equivalent in appropriate subjects, desirably this would include Maths, English, Product Design, Graphic Communications and/or a Science subject;
- ◆ SVQ in Engineering or a related discipline.

Work Experience

Mature learners with suitable relevant work experience may be accepted for entry, or advanced entry; provided the enrolling centre believes that the learner is likely to benefit from undertaking the qualifications. Centres may wish to use Core Skills profiling to assist them in this process.

Access during transition between current and new awards

During the period of transition from existing qualifications to the new HNCs and HND learners might be eligible for credit transfer. Such eligibility is discussed further in Section 6.2.4.

4.1 Core Skills entry profile

The Core Skill entry profile provides a summary of the associated assessment activities that exemplify why a particular level has been recommended for this qualification. The information should be used to identify if additional learning support needs to be put in place for learners whose Core Skills profile is below the recommended entry level or whether learners should be encouraged to do an alternative level or learning programme.

Core Skill	Recommended SCQF entry profile	Associated assessment activities
Communication	5	Good communication skills will be required for learners doing this qualification as they will need to research, analyse, report, and present technical data and documentation.
Numeracy	5	Good numerical skills will be required for learners doing this qualification as they will need to use a range of numerical skills for a range of draughting and design tasks. These tasks could include calculating dimensional geometry, tolerances, design calculations and costings.
Information and Communication Technology (ICT)	5	Good ICT skills are core to these Group Awards. Learners will need a sound understanding of basic ICT as the foundation to use the systems to search online material for research purposes. Also, the creation of CAD, graphical and technical documentation for communication and presentation tasks.
Problem Solving	5	Critical thinking, planning and organisation, review and evaluation are fundamental to all elements of these qualifications. Learners will need to analyse and evaluate existing designs and or design briefs for the purpose of finding and/or creating a design solution.
Working with Others	4	Working as part of a team co-operatively is essential when progressing to industry. There are several opportunities throughout this award for working with others to take place.

5 Additional benefits of the qualification in meeting employer needs

This qualification was designed to meet a specific purpose and what follows are details on how that purpose has been met through mapping of the Units to the aims of the qualification. Through meeting the aims, additional value has been achieved by linking the Unit standards with those defined in National Occupational Standards and/or trade/professional body requirements. In addition, significant opportunities exist for learners to develop the more generic skill, known as Core Skills through doing this qualification.

5.1 Mapping of qualification aims to Units

Code	Unit title	Aims												
		1	2	3	4	5	6	7	8	9	10	11	12	13
H7MB 34	Communication: Practical Skills	X	X	X	X	X	X	X	X	X	X	X	X	
DW1E 34	CAD: 2D I	X	X	X	X		X	X	X	X	X	X	X	
DW12 34	CAD: 2D II	X	X	X	X		X	X	X	X	X	X	X	
HE27 34	CAD: 3D Surface and Solid Modelling	X	X	X	X		X	X	X	X	X	X	X	
HE28 34	CAD: User Systems	X	X	X	X		X	X	X	X	X	X	X	
DW16 34	CAD: Principles	X	X	X	X		X	X	X	X	X	X	X	
DW17 34	Design Methodology	X	X	X	X	X	X	X	X	X	X	X	X	
DW18 34	CAD: Visualisation, Rendering and Presentation	X	X	X	X		X	X	X	X	X	X	X	
DW19 34	CAD: Feature-Based Modelling 1	X	X	X	X		X	X	X	X	X	X	X	
HE69 34	Computer Aided Draughting and Design: Graded Unit 1	X	X	X	X		X	X	X	X	X	X	X	
F214 35	CAD: 3D Animation	X	X	X	X		X	X	X	X	X	X	X	
F217 35	CAD: Feature Based Modelling 2	X	X	X	X		X	X	X	X	X	X	X	
F218 35	CAD: Manufacturing	X	X		X	X	X	X	X	X	X	X	X	

Code	Unit title	Aims												
		1	2	3	4	5	6	7	8	9	10	11	12	13
F219 35	CAD: Prototyping	X	X		X	X	X	X	X	X	X	X	X	
D7J6 35	Project Management	X	X	X	X	X	X	X	X	X	X	X	X	
HE6A 35	Computer Aided Draughting and Design: Graded Unit 2	X	X	X	X		X	X	X	X	X	X	X	
F215 35	CAD: Analysis	X	X	X	X		X	X	X	X		X	X	
F216 35	CAD: Customised Programming	X	X	X	X		X	X	X	X		X	X	
F213 35	CAD: Technical Illustration	X	X	X	X		X	X	X	X		X	X	
F21A 35	CAD: Sheet Metal	X	X	X	X		X	X	X	X		X	X	
HE2C 35	CAD: Systems Management	X	X	X	X		X	X	X	X		X	X	
DW1D 34	CAD: Architectural 1	X	X	X	X		X	X	X	X		X	X	
DW1C 34	CAD: Graphical Design	X	X	X	X		X	X	X	X		X	X	
F329 34	Architectural CADT: Residential Design	X	X	X	X		X	X	X	X		X	X	
F32A 34	Architectural CADT: Principles and Practice	X	X	X	X		X	X	X	X		X	X	
F8LW 34	CADD Skills	X	X	X	X	X	X	X	X	X	X	X	X	
HE2D 34	CAD: Cloud Technologies	X	X	X	X		X	X	X	X		X	X	
HE29 34	CAD: 3D Printing and Scanning	X	X		X		X	X	X	X		X	X	

Code	Unit title	Aims												
		1	2	3	4	5	6	7	8	9	10	11	12	13
HE2A 34	CAD: Drawing Office Practice	X	X	X	X	X	X	X	X	X	X	X	X	
HE2H 35	CAD: Digital Collaboration Practices	X	X	X	X	X	X	X	X	X		X	X	
DR3M 35	Design For Manufacture	X	X	X	X		X	X	X	X		X	X	
H7K0 33	Engineering Mathematics 1	X	X	X	X		X	X	X			X	X	
H7K1 34	Engineering Mathematics 2	X	X	X	X		X	X	X			X	X	
DT46 34	Materials Selection	X	X	X	X		X	X	X	X		X	X	
DR3L 34	Engineering Principles	X	X	X	X		X	X	X	X		X	X	
DE3R 34	Personal Development Planning	X	X	X	X	X	X	X	X	X	X	X	X	
H8T2 33	Workplace Communication in English	X	X	X	X		X	X	X	X		X	X	
HE62 33	Autodesk Certified User: AutoCAD	X	X	X	X		X	X	X	X	X	X	X	X
HE63 33	Autodesk Certified User: Inventor	X	X	X	X		X	X	X	X	X	X	X	X
HE66 33	Autodesk Certified User: Revit	X	X	X	X		X	X	X	X	X	X	X	X
HE68 35	Autodesk Certified Professional: AutoCAD	X	X	X	X		X	X	X	X	X	X	X	X
HE65 35	Autodesk Certified Professional: Inventor	X	X	X	X		X	X	X	X	X	X	X	X

5.2 Mapping of National Occupational Standards (NOS) and/or trade body standards

The following table provides an overview to the SQA Units within the HN Awards and there links to relevant National Occupational Standard. The Units listed cover elements of the underpinning knowledge identified within the NOS.

Code	Unit title	National Occupational Standard																			
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
H7MB 34	Communication: Practical Skills	X		X					X									X		X	
DW1E 34	CAD: 2D I	X						X			X		X	X	X					X	X
HE27 34	CAD: 3D Surface and Solid Modelling	X						X			X		X	X	X					X	
HE28 34	CAD: User Systems								X							X				X	
DW16 34	CAD: Principles	X						X			X		X	X	X			X		X	
DW17 34	Design Methodology		X	X	X	X	X		X	X						X	X	X		X	
DW18 34	CAD: Visualisation, Rendering and Presentation																			X	X
DW19 34	CAD: Feature-Based Modelling 1	X						X			X		X	X	X			X		X	
HE69 34	Computer Aided Draughting and Design: Graded Unit 1		X	X	X	X	X	X	X	X	X		X	X	X	X	X	X		X	X
F214 35	CAD: 3D Animation																			X	X
F217 35	CAD: Feature Based Modelling 2	X						X		X	X		X	X	X			X		X	X
F218 35	CAD: Manufacturing	X						X		X	X	X	X	X	X	X		X		X	
F219 35	CAD: Prototyping		X	X	X	X	X	X	X	X	X		X	X	X	X	X	X		X	

Code	Unit title	National Occupational Standard																			
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
D7J6 35	Project Management								X												
HE6A 35	Computer Aided Draughting and Design: Graded Unit 2		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X

National Occupational Standard			
No	NOS title	No	NOS title
1	SEMAE3-002: Using and interpreting engineering drawings and documents	11	SEMPAT23: Setting CNC machine tools for operation
2	SEMEM4-04: Identifying engineering design requirements of clients	12	SEMPEO2-04: Producing mechanical engineering drawings using a CAD system
3	SEMEM4-07: Establish an engineering design brief	13	SEMETS2-04: Producing /modifying mechanical or fabrication engineering drawings using a CAD system
4	SEMEM4-08: Create engineering designs	14	ECIDD01: Read and extract information from engineering drawings and specifications for design and draughting activities.
5	SEMEM4-09: Evaluate engineering designs	15	ECIDD02: Identify and assess factors that impact on engineering design briefs
6	SEMEM4-25: Develop a strategy for the engineering design process	16	ECIDD03: Complete engineering designs
7	SEMEM4-32: Produce detailed drawings using computer aided techniques	17	ECIDD04: Review technical information required to produce detailed engineering drawings
8	SEMEM4-33: Undertaking project management activities	18	ECIDD05: Produce detailed drawings to support engineering construction activities
9	SEMENGL4-19: Solve engineering problems	19	ECIDD09: Communicate engineering design options
10	SEMPEO2-32: Producing electrical or electronic engineering drawings using a CAD system	20	SKSANIM15: Render 3D animation

5.3 Mapping of Core Skills development opportunities across the qualifications

Unit code	Unit title	Communication		Numeracy		ICT		Problem Solving			Working with Others	
		Written	Oral	Using Number	Using Graphical Information	Accessing Information	Providing/Creating Information	Critical Thinking	Planning and Organising	Reviewing and Evaluating	Working Co-operatively with Others	Reviewing Co-operative Contribution
H7MB 34	Communication: Practical Skills	E6	E6			S6	S6	S6	S6	S6	S6	S6
DW1E 34	CAD: 2D I			S6	S6	S6	S6					
DW12 34	CAD: 2D II			S6	S6	S6	S6	S6	S6	S6		
HE27 34	CAD: 3D Surface and Solid Modelling			S6	S6	S6	S6	S6	S6	S6		
HE28 34	CAD: User Systems	S6	S6	S6	S6	S6	S6					
DW16 34	CAD: Principles	S6	S6	S6	S6	S6	S6	S6	S6	S6		
DW17 34	Design Methodology	S6	S6					S6	S6	S6	S6	S6
DW18 34	CAD: Visualisation, Rendering and Presentation	S6	S6					S6	S6	S6	S6	S6
DW19 34	CAD: Feature-Based Modelling 1							S6	S6	S6		
HE69 34	Computer Aided Draughting and Design: Graded Unit 1	S6	S6			S6	S6	E6	E6	E6		

Unit code	Unit title	Communication		Numeracy		ICT		Problem Solving			Working with Others	
		Written	Oral	Using Number	Using Graphical Information	Accessing Information	Providing/Creating Information	Critical Thinking	Planning and Organising	Reviewing and Evaluating	Working Co-operatively with Others	Reviewing Co-operative Contribution
F214 35	CAD: 3D Animation	S6	S6	S6	S6	S6	S6	S6	S6	S6		
F217 35	CAD: Feature Based Modelling 2	S6	S6	S4	S4	S6	S6	S6	S6	S6		
F218 35	CAD: Manufacturing	S6	S6		S6	S6	S6	S6	S6	S6		
F219 35	CAD: Prototyping	S6	S6		S5	S6	S6		S6	S6		
D76J 35	Project Management											
HE6A 35	Computer Aided Draughting and Design: Graded Unit 2	S6	S6	S6	S6	S6	S6	S6	S6	S6		
F215 35	CAD: Analysis			S6	S6	S6	S6	S6	S6	S6		
F216 35	CAD: Customised Programming	S6	S6	S6	S6	S6	S6	S6	S6	S6		
F213 35	CAD: Technical Illustration	S6	S6			S6	S6	S6	S6	S6		
F21A 35	CAD: Sheet Metal	S6	S6	S5	S5	S6	S6	S6	S6	S6		
DR3M 35	Design for Manufacture	S6	S6					S6	S6	S6	S6	S6
HE2C 35	CAD: Systems Management	S6	S6			S6	S6	S6	S6	S6		

Unit code	Unit title	Communication		Numeracy		ICT		Problem Solving			Working with Others	
		Written	Oral	Using Number	Using Graphical Information	Accessing Information	Providing/Creating Information	Critical Thinking	Planning and Organising	Reviewing and Evaluating	Working Co-operatively with Others	Reviewing Co-operative Contribution
DW1C 34	CAD: Graphical Design	S6	S6			S6	S6	S6	S6	S6		
DW1D 34	CAD: Architectural 1			S6	S6	S6	S6	S6	S6	S6		
F32A 34	Architectural CADT: Principles and Practice			S6	S6	S6	S6	S6	S6	S6		
F329 34	Architectural CADT: Residential Design			S6	S6	S6	S6	S6		S6		
F8LW 34	CADD Skills						S6	S6		S5	S5	S6
H7K0 33	Engineering Mathematics 1			E6								
H7K1 34	Engineering Mathematics 2			E6								
DT46 34	Materials Selection	S6						S6		S6	S6	S6
DR3L 34	Engineering Principles	S5						S6				
HE2D 34	CAD: Cloud Technologies			S6	S6	S6	S6	S6	S6	S6		
HE29 34	CAD: 3D Printing and Scanning	S6	S6	S6	S6			S6	S6	S6	S6	S6
HE2A 34	CAD: Drawing Office Practice	S6	S6			S6	S6				S6	S6

Unit code	Unit title	Communication		Numeracy		ICT		Problem Solving			Working with Others	
		Written	Oral	Using Number	Using Graphical Information	Accessing Information	Providing/Creating Information	Critical Thinking	Planning and Organising	Reviewing and Evaluating	Working Co-operatively with Others	Reviewing Co-operative Contribution
HE2H 35	CAD: Digital Collaboration Practices	S6	S6								S6	S5
DE3R 34	Personal Development Planning	S6	S6			S6	S6	S6	S6	S6		
H8T2 33	Workplace Communication in English	E6	E6									

5.4 Assessment Strategy for the qualifications

Unit		Assessment				
		Outcome 1	Outcome 2	Outcome 3	Outcome 4	Outcome 5
H7MB 34	Communication: Practical Skills	<p>Assessment for all Outcomes will be conducted in open-book conditions.</p> <p>An extended case study or project could provide a context for integrating Outcomes. For example, Outcome 1 assessment could involve extended reading of one or more reports, papers or articles on current technical issues directly relevant to a written document prepared for Outcome 2.</p> <p>There may be opportunities for learners to explore innovative design ideas, products or services. Group discussion during formative preparation would enhance knowledge and develop essential interpersonal and problem solving skills. For summative assessment purposes, learners should summarise and evaluate one text individually, and record individual responses in writing or orally, using their own words. Further research on aspects of the same topic could be carried out to inform a range of proposals presented and discussed in a meeting (Outcome 3). Alternatively, individual presentations (Outcome 3) could be supported by a written report presenting key information, supporting detail and conclusions/solutions or recommendations (Outcome 2).</p>				
DW1E 34	CAD: 2D I	Outcomes 1–3 could be assessed as one integrated practical assessment, in open-book supervised conditions.			Practical and graphical evidence generated under open-book supervised conditions.	

Unit		Assessment				
		Outcome 1	Outcome 2	Outcome 3	Outcome 4	Outcome 5
DW12 34	CAD: 2D II	Outcomes 1–3 could be assessed as one integrated practical assessment, in open-book supervised conditions.				
HE27 34	CAD: 3D Surface and Solid Modelling	Practical evidence generated under open-book supervised conditions.	Practical evidence generated under open-book supervised conditions.	Practical evidence generated under open-book supervised conditions.	Written and/or oral recorded evidence generated under open-book supervised conditions.	
HE28 34	CAD: User Systems	Practical evidence with written and/or oral recorded element generated under open-book supervised conditions.	Practical evidence generated under open-book supervised conditions.	Practical evidence generated under open-book supervised conditions.	Practical evidence generated under open-book supervised conditions.	
DW16 34	CAD: Principles	Written or oral recorded evidence generated under open-book supervised conditions.	Practical evidence generated under open-book supervised conditions.	Practical evidence generated under open-book supervised conditions.	Practical evidence generated under open-book supervised conditions.	
DW17 34	Design Methodology	Written and/or oral recorded evidence generated under open-book supervised conditions.	Outcomes 2, 3 and 4 could be delivered and assessed holistically with the creation of one integrated assessment. This assessment would be in the form of a project based activity.			

Unit		Assessment				
		Outcome 1	Outcome 2	Outcome 3	Outcome 4	Outcome 5
DW18 34	CAD: Visualisation, Rendering and Presentation	Outcomes 1, 2 and 3 could be delivered and assessed holistically with the creation of one integrated open-book supervised assessment. This assessment would be in the form of a project based activity.				
DW19 34	CAD: Feature-Based Modelling 1	Outcomes 1, 2, 3 and 4 could be delivered and assessed holistically with the creation of a continuing progressive assessment process. Each Outcome must be completed before moving to the next. This assessment could be in the form of a project based activity with each Outcome identified as a milestone towards completion.				Written or oral recorded evidence generated under open-book supervised conditions.
HE69 34	Computer Aided Draughting and Design: Graded Unit 1	Project based Graded Unit assessment.				
F214 35	CAD: 3D Animation	Outcomes 1, 2, 3 and 4 are all practical in nature and could be delivered and assessed holistically with the creation of one integrated assessment. This assessment would be in the form of a project based activity.				
F217 35	CAD: Feature Based Modelling 2	Outcomes 1, 2, 3 and 4 could be assessed as a single assessment in open-book supervised conditions.				
F218 35	CAD: Manufacturing	Written or oral recorded assessment in supervised conditions.	Outcomes 2 and 3 can be assessed separately or as part of a combined practical assessment event in open-book supervised conditions.			

Unit		Assessment				
		Outcome 1	Outcome 2	Outcome 3	Outcome 4	Outcome 5
F219 35	CAD: Prototyping	Written or oral recorded evidence generated under open-book supervised conditions.	Outcomes 2, 3 and 4 could be delivered and assessed holistically with the creation of one integrated assessment. This assessment could be in the form of a project based activity. This task could be done as part of a team, but care must be taken to ensure all team members contribute and produce the evidence required to meet the needs of the Unit specification.			
D76J 35	Project Management	The Unit may be assessed by two short written assessments for Outcome 1 and one for Outcome 2. Outcome 3 and Outcome 4 will be assessed by issuing the learner with user requirements details for the development of a project, and the learner will prepare a schedule of development work for that project, meeting the user's needs and the Evidence Requirements for these Outcomes. The assessments for Outcome 1 and Outcome 2 will be open-book.				
HE6A 35	Computer Aided Draughting and Design: Graded Unit 2	Project based Graded Unit assessment.				
F215 35	CAD: Analysis	Outcomes 1, 2 and 3 could be assessed separately or as part of a combined assessment event should a case study approach be used. Practical assessment in open-book supervised conditions.	Practical evidence generated under open-book supervised conditions.			
F216 35	CAD: Customised Programming	Practical evidence generated under open-book supervised conditions.	Outcomes 2, 3 and 4 could be delivered and assessed holistically with the creation of a continuing progressive assessment process. Each Outcome must be completed before moving to the next. This assessment could be in the form of a project based activity with each Outcome identified as a milestone towards completion.			

Unit		Assessment				
		Outcome 1	Outcome 2	Outcome 3	Outcome 4	Outcome 5
F213 35	CAD: Technical Illustration	Outcomes 1, 2 and 3 could be delivered and assessed holistically with the creation of a continuing progressive assessment process. Each Outcome must be completed before moving to the next. This assessment could be in the form of a project based activity with each Outcome identified as a milestone towards completion.			Written and/or oral recorded evidence generated under open-book supervised conditions.	
F21A 35	CAD: Sheet Metal	Outcomes 1, 2 and 3 could be delivered holistically in open-book supervised conditions. The assessment could be in the form of a project based activity.				
DR3M 35	Design For Manufacture	Written and/or oral recorded evidence generated under closed-book supervised conditions.	Written and/or oral recorded evidence generated under closed-book supervised conditions.	Outcome 3 should be presented in two parts: a portfolio of evidence providing details of the final design solution and a presentation where the learner provides information on the final design solution to the customer.		

Unit		Assessment				
		Outcome 1	Outcome 2	Outcome 3	Outcome 4	Outcome 5
HE2C 35	CAD: Systems Management	Evidence for the Knowledge and/or Skills in this Outcome will be provided on a sample basis. In any assessment of this Outcome four of the eight Knowledge and/or Skills should be sampled, demonstrating that the learner can create a minimum of six customised changes.	Evidence for the Knowledge and/or Skills in this Outcome will be provided on a sample basis. In any assessment of this Outcome four of the seven Knowledge and/or Skills should be sampled, demonstrating that the learner can create a minimum of four custom tools.	Evidence for the Knowledge and/or Skills in this Outcome will be provided on a sample basis. In any assessment of this Outcome five of the seven Knowledge and/or Skills items should be sampled, demonstrating that the learner can create a minimum of six customised changes.	Evidence for the Knowledge and/or Skills in this Outcome will be provided by the learners choice as written and/or oral recorded or a presentation of their custom setup reflecting Outcomes 1–3.	
DW1C 34	CAD: Graphical Design	Outcomes 1 and 2 should be practical and assessed as separate assessments carried out at the end of the delivery of the Unit. Assessment should be conducted under closed-book supervised conditions.				
DW1D 34	CAD: Architectural 1	Outcomes 1, 2, 3 and 4 could be delivered and assessed holistically with the creation of a continuing progressive assessment process. Each Outcome must be completed before moving to the next. This assessment could be in the form of a project based activity with each Outcome identified as a milestone towards completion. Assessment should be conducted under open-book supervised conditions.				

Unit		Assessment				
		Outcome 1	Outcome 2	Outcome 3	Outcome 4	Outcome 5
F32A 34	Architectural CADT: Principles and Practice	<p>The explanation of architectural CAD drawing types for this Outcome is a closed-book assessment and must be supervised and held under controlled conditions.</p> <p>Practical evidence for Outcome 1 should be generated under open-book supervised conditions.</p>	<p>Outcomes 2, 3 and 4 could be delivered and assessed holistically with the creation of a continuing progressive assessment process. Each Outcome must be completed before moving to the next. This assessment could be in the form of a project based activity with each Outcome identified as a milestone towards completion.</p>			
F329 34	Architectural CADT: Residential Design	<p>Outcomes 1, 2, 3, 4 and 5 could be delivered and assessed holistically with the creation of a continuing progressive assessment process. Each Outcome must be completed before moving to the next. This assessment could be in the form of a project based activity with each Outcome identified as a milestone towards completion. Evidence should be generated under open-book supervised conditions.</p>				
F8LW 34	CADD Skills	Practical evidence generated under open-book supervised conditions.	Practical evidence generated under open-book supervised conditions.	Practical evidence generated under open-book supervised conditions.	Practical evidence generated under open-book supervised conditions.	

Unit		Assessment				
		Outcome 1	Outcome 2	Outcome 3	Outcome 4	Outcome 5
H7K0 33	Engineering Mathematics 1	It is recommended that the assessment for all three Outcomes takes place at a single end of Unit assessment event. Outcomes may also be assessed individually. Learners are required to provide written and/or oral recorded evidence and all assessments should be unseen, closed-book and carried out under supervised, controlled conditions.				
H7K1 34	Engineering Mathematics 2	It is recommended that the assessment for all three Outcomes takes place at a single end of Unit assessment event. Outcomes may also be assessed individually. Learners are required to provide written and/or oral recorded evidence and all assessments should be unseen, closed-book and carried out under supervised, controlled conditions.				

Unit		Assessment				
		Outcome 1	Outcome 2	Outcome 3	Outcome 4	Outcome 5
DT46 34	Materials Selection	This Unit lends itself to holistic assessment. The assessment for Outcomes 1, 2 and 3 could be combined together into one written/oral recorded assessment paper. Assessment should be conducted under closed-book, supervised conditions.			Outcome 4 should be assessed by two assignments in which learners are asked to observe material test laboratory experiments, record results and write/oral record a report on the results obtained for each assignment.	
DR3L 34	Engineering Principles	This Unit should be assessed on an Outcome-by-Outcome basis. Outcomes 1, 2 and 3 should each be assessed by an assignment in which learners are asked to complete a test laboratory experiment and write/oral record a report on the results obtained.				
HE2D 34	CAD: Cloud Technologies	Written and/or oral recorded generated under open-book supervised conditions.	Practical evidence generated under open-book supervised conditions.	Practical evidence generated under open-book supervised conditions.	Practical evidence generated under open-book supervised conditions.	

Unit		Assessment				
		Outcome 1	Outcome 2	Outcome 3	Outcome 4	Outcome 5
HE29 34	CAD: 3D Printing and Scanning	Written and/or oral recorded and practical evidence generated under open-book supervised conditions.	Written and/or oral recorded and practical evidence generated under open-book supervised conditions.	Written and/or oral recorded and practical evidence generated under open-book supervised conditions.	Written and/or oral recorded and practical evidence generated under open-book supervised conditions.	
HE2A 34	CAD: Drawing Office Practice	Written and/or oral recorded evidence generated under open-book supervised conditions.	Written and/or oral recorded evidence generated under open-book supervised conditions.	Practical evidence generated under open-book supervised conditions.	Practical evidence generated under open-book supervised conditions.	Practical evidence generated under open-book supervised conditions.
HE2H 35	CAD: Digital Collaboration Practices	Written and/or oral recorded and graphical evidence generated under open-book supervised conditions.	Use of a case study would allow centres to integrate Outcomes 2, 3 and 4 into a whole or combination of Outcomes. Assessments should be carried out in controlled, supervised, open-book conditions. Learners should be allowed to refer to relevant course material as well as current standards such as British Standards/Publicly Available Standards. There may be opportunity for investigations to be conducted by groups, however any individual written or presented work produced for assessment should be authenticated.			
DE3R 34	Personal Development Planning	The Unit should be assessed holistically. To achieve this a learner should create, maintain and present a portfolio of evidence - a personal development portfolio. The activities associated with the Unit should provide ample opportunities for learners to generate and gather the required evidence of achievement.				

6 Guidance on approaches to delivery and assessment

The PDA, HNC and HND Computer Aided Draughting and Design qualifications aim to give learners the opportunity to develop industry relevant CAD skills and knowledge of the design process related to the engineering sector.

Each of the qualifications has relevant Unit specifications that provide detailed guidance for the Evidence Requirements and assessment procedures for each assessment event. Where possible and appropriate, integrated assessments should be used to provide a more holistic approach to assessing learners. Suggestion as to where integration of assessment could be achieved is given in Section 5.4.

Assessment Support Packs (ASPs) have been produced for mandatory Units. Centres can use the ASPs for assessment purposes as long as they are kept secure. Centres may use the ASPs as a guide and/or template for producing locally devised assessments.

The following section gives suggested sequence of Unit delivery for the PDA, HNC and HND qualifications.

6.1 Sequencing/integration of Units

PDA Computer Aided Draughting and Design					
Suggested sequencing of delivery					
Semester 1			Semester 2		
Unit code	Unit title	SQA credit	Unit code	Unit title	SQA credit
DW1E 34	CAD: 2D I	1	DW19 34	CAD: Feature-Based Modelling 1	1
DW13 34	CAD: 3D Surface and Solid Modelling	2	DW16 34	CAD: Principles	1
			DW1D 34	CAD: Architectural 1	1
Total SQA Credits		3	Total SQA Credits		3

HNC/HND Year 1 Computer Aided Draughting and Design					
Suggested sequencing of delivery					
Semester 1			Semester 2		
Unit code	Unit title	SQA credit	Unit code	Unit title	SQA credit
DW1E 34	CAD: 2D I	1	DW18 34	CAD: Visualisation, Rendering and Presentation	1
DW16 34	CAD: Principles	1	HE29 34	CAD: 3D Printing and Scanning	1
DW17 34	Design Methodology	1	HE2A 34	CAD: Drawing Office Practice	1
HE28 34	CAD: User Systems	1	DW1D 34	CAD: Architectural 1	1
HE27 34	CAD: 3D Surface and Solid Modelling	2	H7K0 33	Engineering Mathematics 1	1
DW19 34	CAD: Feature-Based Modelling 1	1	DW1C 34	CAD: Graphical Design	1
H7MB 34	Communication: Practical Skills	1	HE69 34	Computer Aided Draughting and Design: Graded Unit 1	1
Total SQA Credits		8	Total SQA Credits		7

HND Year 2 Computer Aided Draughting and Design					
Suggested sequencing of delivery					
Semester 1			Semester 2		
Unit code	Unit title	SQA credit	Unit code	Unit title	SQA credit
F217 35	CAD: Feature Based Modelling 2	2	F219 35	CAD: Prototyping	2
F218 35	CAD: Manufacturing	2	F213 35	CAD: Technical Illustration	2
F214 35	CAD: 3D Animation	2	F215 35	CAD: Analysis	1
D76J 35	Project Management	1	F21A 35	CAD: Sheet Metal	1
			HE6A 35	Computer Aided Draughting and Design: Graded Unit 2	2
Total SQA Credits		7	Total SQA Credits		8

6.2 Recognition of Prior Learning

SQA recognises that learners gain knowledge and skills acquired through formal, non-formal and informal learning contexts.

In some instances, a full Group Award may be achieved through the recognition of prior learning. However, it is unlikely that a learner would have the appropriate prior learning and experience to meet all the requirements of a full Group Award.

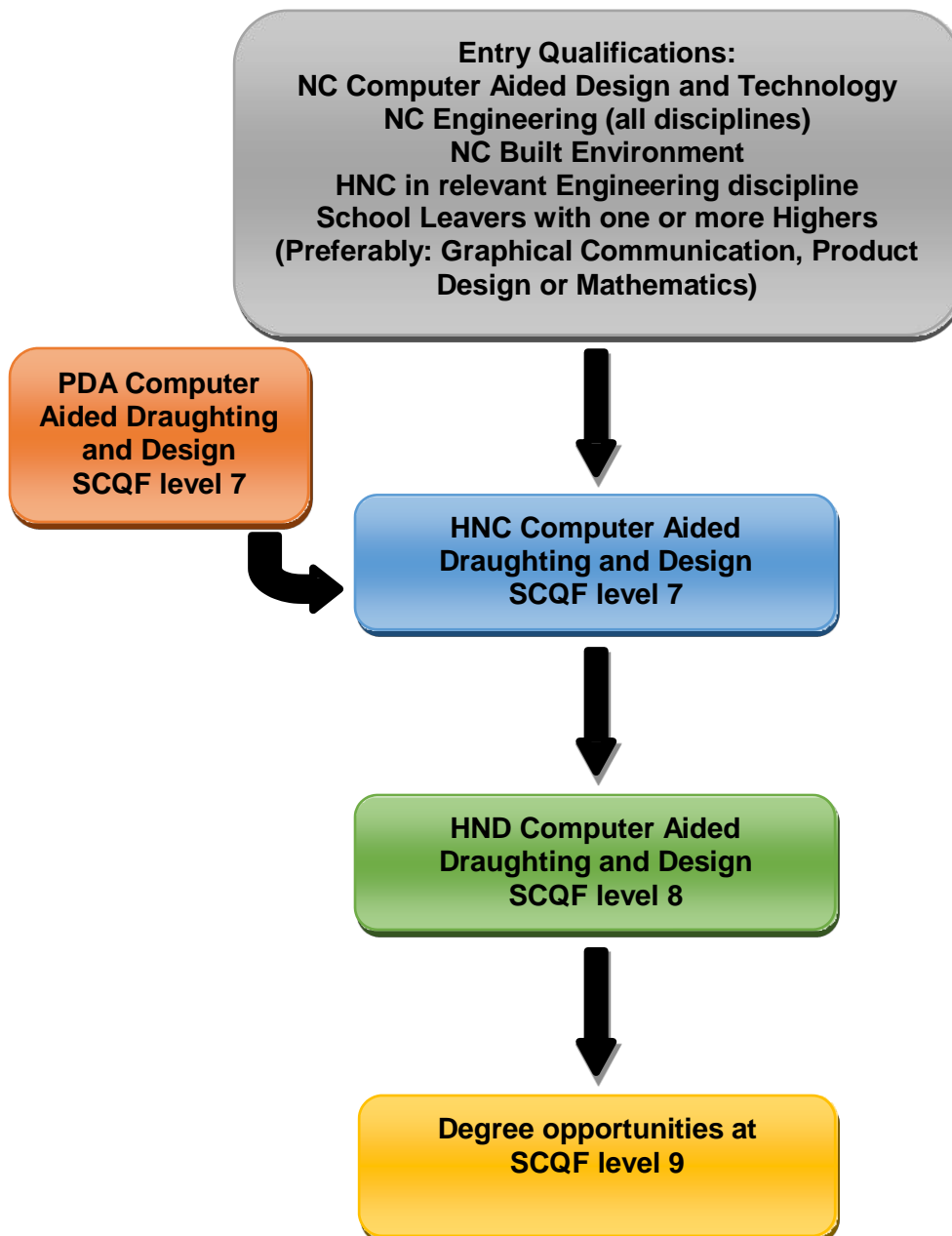
The recognition of prior learning may **not** be used as a method of assessing in the following types of Units and assessments:

- ◆ HN Graded Units
- ◆ Course and/or external assessments
- ◆ Other integrative assessment Units (which may or not be graded)
- ◆ Certain types of assessment instruments where the standard may be compromised by not using the same assessment method outlined in the Unit
- ◆ Where there is an existing requirement for a licence to practice
- ◆ Where there are specific health and safety requirements
- ◆ Where there are regulatory, professional or other statutory requirements
- ◆ Where otherwise specified in an Assessment Strategy

More information and guidance on the *Recognition of Prior Learning* (RPL) may be found on our website www.sqa.org.uk.

The following sub-sections outline how existing SQA Unit(s) may contribute to this Group Award. Additionally, they also outline how this Group Award may be recognised for professional and articulation purposes.

6.2.1 Articulation and/or progression



There are opportunities to progress from HND to University. At present, those students who successfully complete the HND award progress onto the following degree programmes at the University of the West of Scotland:

- ◆ BSc (Hons) Computer Aided Design (Entry Year 3)
- ◆ BSc (Hons) Engineering Management (Entry Year 3)

6.2.2 Professional recognition

The Higher National qualifications in Computer Aided Draughting and Design have been developed to facilitate the career progression of learners to achieve professional status in the future. Whilst studying on the awards, learners can apply to become student members of the Institution of Engineering Designers (IED). On completion of the award, learners can apply to become full members of the IED (MIED) and progress towards Eng Tech, IEng or CEng status with appropriate industry experience.

As with most professional bodies, the IED provide recognition of HNC and HND awards against their educational requirements for membership. The IED will accredit individual courses at colleges and universities, as is the case with one of the current HND delivering centres. Professional body membership requires a combination of the educational base and verification of professional experience.

6.2.3 Transitional Arrangements

It is recommended that learners who are in the process of completing one of the predecessor awards finish it rather than switching to the new, revised award. However, there may be occasions when it is not possible for learners to complete the existing award, eg where they were unable to complete their studies due to ill health or difficulties with funding or employment and where the centre has progressed to offer the new award and only one or two Units need to be completed. In these cases it is recommended that the suggested credit transfer arrangements given in Section 6.2.4 be considered.

6.2.4 Credit transfer

All decisions relating to credit transfer remain with centres. However, the table below provides details and guidance on credit transfer arrangements agreed by the Qualifications Development Team.

Centres must retain proof of all credit transfer arrangements (normally a photocopy of the learner's Scottish Qualifications Certificate) for the purposes of internal and external verification.

New Unit Code	New Unit Title	Old Unit Code	Old Unit Title	Credit Transfer	Comments
H72F 34	Site Administration	DW4L 34	Site Administration	No	No automatic credit transfer
H726 34	Building Measurement and Cost Studies	DW3X 34	Building Measurement and Cost Studies	No	No automatic credit transfer
HE28 34	CAD: User Systems	DW14 34	CAD: User Systems	Yes	Full credit transfer
HE27 34	CAD: 3D Surface and Solid Modelling	DW13 34	CAD: 3D Modelling	Yes	Full credit transfer
HE2C 35	CAD: Systems Management	DW1A 35	CAD: Systems Management	Yes	Full credit transfer

6.3 Opportunities for e-assessment

E-assessment may be appropriate for some elements in these Awards. By e-assessment we mean assessment which is supported by Information and Communication Technology (ICT), such as e-testing or the use of e-portfolios or social software. Centres which wish to use e-assessment must ensure that the national standard is applied to all learner evidence and that conditions of assessment as specified in the Evidence Requirements are met, regardless of the mode of gathering evidence.

The most up-to-date guidance on the use of e-assessment to support SQA's qualifications is available at <http://www.sqa.org.uk/sqa/68835.5665.html>.

6.4 Support materials

A list of existing ASPs is available to view on SQA's website.

6.5 Resource requirements

Staff involved in the delivery of these qualifications should be suitably qualified and skilled in the use of advanced level CAD and broader engineering/construction disciplines. Staff would be required to have good IT skills.

Centres delivering this award would be required to have a high specification CAD facility with powerful CAD hardware and up to date industry CAD, animation and graphic design software. In addition, peripheral devices such as, printers, and large scale plotters should be readily available. Access to appropriate office based software for word processing, spreadsheets and databases is essential for delivery of the award.

Access to the internet is essential for research purposes throughout the course, as well as, the delivery of the following Unit:

HE2H 35 *CAD: Digital Collaboration Practices*

3D printing and scanning technology should also be available for delivery of the following Units:

HE29 34 *CAD: 3D Printing and Scanning*
F219 35 *CAD: Prototyping*

3D printing and scanning could also be encouraged to be used in the delivery of the Graded Units in both Year 1 and 2 of the award, as well as all other design based Units.

It is recommended that appropriate journals, books, standards and e-books are sourced to support the learning and teaching process.

The Autodesk vendor qualifications that are embedded within the qualifications are accessed via Certiport online system. Any centre choosing to deliver the Autodesk Certified User or Professional vendor qualifications as part of the framework will be require access to Certiport online. Costs for sitting the online exams can be requested through the Certiport website and this is done on a centre by centre basis. Delivering centres are responsible for acquiring, setting up and accessing system and online tests.

7 General information for centres

Equality and inclusion

The Unit specifications making up this Group Award have been designed to ensure that there are no unnecessary barriers to learning or assessment. The individual needs of learners will be taken into account when planning learning experiences, selecting assessment methods or considering alternative evidence. Further advice can be found on our website www.sqa.org.uk/assessmentarrangements.

Internal and external verification

All instruments of assessment used within this/these qualification(s) should be internally verified, using the appropriate policy within the centre and the guidelines set by SQA.

External verification will be carried out by SQA to ensure that internal assessment is within the national guidelines for these qualifications.

Further information on internal and external verification can be found in *SQA's Guide to Assessment* (www.sqa.org.uk/GuideToAssessment).

8 Glossary of terms

Embedded Core Skills: is where the assessment evidence for the Unit also includes full evidence for complete Core Skill or Core Skill components. A learner successfully completing the Unit will be automatically certificated for the Core Skill. (This depends on the Unit having been successfully audited and validated for Core Skills certification.)

Finish date: The end of a Group Award's lapsing period is known as the finish date. After the finish date, the Group Award will no longer be live and the following applies:

- ◆ learners may not be entered for the Group Award
- ◆ the Group Award will continue to exist only as an archive record on the Awards Processing System (APS)

Graded Unit: Graded Units assess learners' ability to integrate what they have learned while working towards the Units of the Group Award. Their purpose is to add value to the Group Award, making it more than the sum of its parts, and to encourage learners to retain and adapt their skills and knowledge.

Lapsing date: When a Group Award is entered into its lapsing period, the following will apply:

- ◆ the Group Award will be deleted from the relevant catalogue
- ◆ the Group Award specification will remain until the qualification reaches its finish date at which point it will be removed from SQA's website and archived
- ◆ no new centres may be approved to offer the Group Award
- ◆ centres should only enter learners whom they expect to complete the Group Award during the defined lapsing period

SQA credit value: The credit value allocated to a Unit gives an indication of the contribution the Unit makes to an SQA Group Award. An SQA credit value of 1 given to an SQA Unit represents approximately 40 hours of programmed learning, teaching and assessment.

SCQF: The Scottish Credit and Qualification Framework (SCQF) provides the national common framework for describing all relevant programmes of learning and qualifications in Scotland. SCQF terminology is used throughout this guide to refer to credits and levels. For further information on the SCQF visit the SCQF website at www.scqf.org.uk.

SCQF credit points: SCQF credit points provide a means of describing and comparing the amount of learning that is required to complete a qualification at a given level of the Framework. One National Unit credit is equivalent to 6 SCQF credit points. One National Unit credit at Advanced Higher and one Higher National Unit credit (irrespective of level) is equivalent to 8 SCQF credit points.

SCQF levels: The level a qualification is assigned within the framework is an indication of how hard it is to achieve. The SCQF covers 12 levels of learning. HNCs and HNDs are available at SCQF levels 7 and 8 respectively. Higher National Units will normally be at levels 6–9 and Graded Units will be at level 7 and 8. National Qualification Group Awards are available at SCQF levels 2–6 and will normally be made up of National Units which are available from SCQF levels 2–7.

Subject Unit: Subject Units contain vocational/subject content and are designed to test a specific set of knowledge and skills.

Signposted Core Skills: refers to opportunities to develop Core Skills arise in learning and teaching but are not automatically certificated.

History of changes

It is anticipated that changes will take place during the life of the qualification and this section will record these changes. This document is the latest version and incorporates the changes summarised below. Centres are advised to check SQA's APS Navigator to confirm they are using the up to date qualification structure.

NOTE: Where a Unit is revised by another Unit:

- ◆ No new centres may be approved to offer the Unit which has been revised.
- ◆ Centres should only enter learners for the Unit which has been revised where they are expected to complete the Unit before its finish date.

Version Number	Description	Date

Acknowledgement

SQA acknowledges the valuable contribution that Scotland's colleges have made to the development of this qualification.

9 General information for learners

This section will help you decide whether this is the qualification for you by explaining what the qualification is about, what you should know or be able to do before you start, what you will need to do during the qualification and opportunities for further learning and employment.

The Professional Development Award (PDA), Higher National Certificate (HNC) and Higher National Diploma (HND) in Computer Aided Draughting and Design have been developed to give you the opportunity to develop the practical skills and underpinning knowledge of CAD, the design process and wider engineering technology. The course delivery is mainly based in a classroom using industry standard CAD systems.

Before commencing the course you should have an interest in CAD, engineering design and technology. A general level of IT skills would be beneficial, and good English and Mathematics skills are desirable. Learners who have studied Graphical Communication and/or Product Design at school would see this course as a natural progression route.

The course aims to develop practical CAD skills through the use of tutor led tutorials, projects and design activities. On occasion you may be required to work as part of a team to solve design problems and provide a suitable solution. You will be required to write/oral record and present researched information across most Units of the award.

Specific tasks will include the use of a CAD system to produce 2-Dimensional (2D) details and drawings, 3-Dimensional (3D) part and assembly models, 3D animations, and technical illustrations. Other tasks that you may be asked to do could include, the production of physical prototypes (produced by hand and 3D printed), creation of hand drawn sketches, using mathematics skills to solve design problems and presenting final design solutions using traditional and technological processes.

The framework of the PDA is formed from 6 credits of the HNC. Completion of the HNC would give 12 credits towards the HND. Progression from one award to the next should be seamless. On completion of the HND award you may choose to progress onto a course of study at University or into industry.

The PDA award is considered suitable for anyone looking to enhance their skills in the fundamental application of CAD in industry. The PDA is especially considered to be a good course for those who are already in employment within an engineering discipline and looking to widen their own skillset.

The HNC and HND awards are aimed at learners who want to start or change their career and have a desire to move into engineering with a specific focus on CAD and design. Employment opportunities exist within the engineering, manufacturing and construction sectors as CAD Technician and Junior Designers.

Individuals, who are studying towards the HND award and are interested in progressing to professional status, may choose to register with the Institution of Engineering designers as student members and on completion of the award as full members progressing towards Eng Tech, IEng or CEng status.