Arrangements for:

HND Computer Aided Draughting and Design (CADD) at

SCQF level 8

Group Award Code: G8VT 16

Validation date: 21 June 2007

Date of original publication: September 2008

Version: 03 (May 2015)

Acknowledgement

SQA acknowledges the valuable contribution that Scotland's colleges have made to the development of Higher National qualifications.

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.

Version number	Description	Date
03	**Revision of Unit:** D77G 34 'Communication: Practical Skills' has been revised by H7MB 34 'Communication: Practical Skills' and will finish on 31/07/2016.	08/05/2015
02	Communication Unit removed from credit transfer grid.	20/05/09

Contents

1 Introduction

This is the Arrangements document for the revised Group Award HND Computer Aided Draughting and Design (CADD) at SCQF level 8. This document includes: background information on the development of the Group Award, its aims, guidance on access, details of the Group Award structure, and guidance on delivery.

This revised HND CADD qualification is designed to equip candidates with the knowledge, understanding and skills required for success in current and future employment or for progression to further academic and/or professional qualifications. It is a revision of the previous HND CADD. This award is a progression from the 6HNC CADD which was validated in June 2005

This award has been revised as part of a comprehensive review of all current SQA HN provision in all subject areas.

2 Rationale for the revision of the Group Award

2.1 Background to the development of this qualification

Globalisation continues to create new and exciting opportunities for many industries in a range of countries considered to be old, current or future markets. Engineering, construction and many design-orientated disciplines continue to flourish in this a global market. The revised HND CADD award will provide candidates with a relevant knowledge and skills base to gain employment in this market.

The fragmentation of heavy industry and other large local employers within Scotland, the pressure of keeping up with new technological developments and the growing consumer market have created a culture where the smaller 'high-tech' and design related companies flourish. However, industry including heavy industry continues to acknowledge a skills gap in the available work force, and a need for specialist training in CADD. Employment in the multi-skilled fields of design, engineering and construction continues to grow and this stimulates a continued demand for well trained employees with appropriate and up to date CADD knowledge and skills.

The key strengths of the qualification are the broad range of topics included in the framework with most topics integrating up-to-date CADD technology. The course is diverse, providing a pathway to a range of employment opportunities and established academic progression in two main disciplines. All topics are industry relevant and overall could satisfy the requirements of the National Occupational Standards for this discipline. As the course has the support of the Institution of Engineering Designers (IED) this award will provide candidates with a route to future professional recognition. It is an award that gives candidates scope to develop and progress in a variety of ways within organisations of all sizes, or through self-employment.

Industry continues to embrace new technology. This award potentially allows a range of candidates to respond to rapidly changing demands, and to recognise and exploit opportunities to study in a mode of their choosing.

The industries utilising CADD technology generally trade in a very competitive market. This award seeks to foster an innovative, enterprising and creative approach in candidates, developing key skills for employability that will fit with employers seeking to keep pace with the fast moving market.

The HNC CADD, which was validated in December 2005, also gave a focused foundation for the HND to build upon.

2.2 Market research, consultation and development processes

Market research, consultation and development of the HND award was carried out by a Qualifications Design Team (QDT). A number of consultation exercises were undertaken during the development period with a range of groups with an interest in CADD. The table below details the stakeholder groups and method of consultation.

Stakeholder	**Method of consultation**
Delivering centres	Meetings
Employers	Questionnaire
HE Institutions	Meetings, e-mail and phone
Candidates	E-mail
Professional bodies	Letter and e-mail

2.2.1 Summary of consultation feedback

Stakeholder feedback was positive and confirmed:

- There was a need for the HND CADD award
- The structure and content is reflective of the chosen award title
- Industry is supportive of the HND CADD award and believes the content will deliver the knowledge and skills considered necessary by employers
- Importance of developing Core Skills
- The HND CADD award is supported by Higher Education Institutions and will provide direct articulation to further study
- The HND CADD award is supported by SEMTA the Sector Skills Council for this discipline
- The Institution of Engineering Designers is supportive of the award
- The HND CADD award provides a route for candidates to progress towards professional status ie Eng Tach, Ieng and CEng

- Both former and current HND CADD candidates are supportive of the award and believe that the award provides a qualification that will be beneficial both in current and future employment
- Flexibility was required in the course design to meet the needs of those candidates on part time study
- The award would meet the needs of candidates who wished to develop a broad and deepening range of CADD and Design knowledge and skills
- The award offered a tremendous opportunity for Continuing Professional Development

The consultation process confirmed a considerable demand for and interest in the proposed award, its relevance to employers, and provided strong pointers as to the content which should be included in the proposed HND award. The process also tested the validity of the rationale for the revision of the HND award.

2.2.2 Development process

The QDT modified the proposed award framework in light of the consultation and new/revised Unit specifications were circulated to centre and employer stakeholders for further comment.

3 Aims of the Group Award

The main aim of the HND Computer Aided Draughting and Design (CADD) Group Award is to provide candidates with the opportunity to develop a high level of CADD knowledge and skills matching the needs of the industries currently using CADD technology. Candidates will also develop knowledge and understanding of the design process and the stages of design where CADD can be utilised in the achievement of a desirable design solution.

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

3.1 General aims of the Group Award

1 To provide the competences required by employers across the range of employment situations, including full-time, part-time or freelance work.

2 To enable candidates to progress 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 will enable progression within the SCQF (Scottish Credit and Qualification Framework) or lead to employment.

4 To develop skills in study, research, analysis, and improve candidate's ability to define and solve problems.

5 To develop candidate's ability to be flexible and work cooperatively with others.

6 To develop candidate's responsibility for own learning.

3.2 Specific aims of the Group Award:

7 To enable candidates to enter employment as CAD technicians, draughtsmen, junior designers and designers in a range of disciplines such as engineering design/manufacture, architectural design/detailing, product design, furniture design, interior design, landscape design, sign design, jewellery design and civil/structural design, etc.

8 To provide an award that enables candidates to achieve appropriate professional body recognition, in particular but not exclusively, the Institution of Engineering Designers, initially as studied and potentially progressing to full membership and either Eng Tech, IEng or CEng recognition.

9 To provide candidates with a range of contemporary vocational skills including the preparation, co-ordination and communication of technical information including drawings, graphical information, reports and schedules, contributing to meeting relevant statutory regulations and controlling projects by monitoring agreed standards and obtaining, recording and organising information.

10 To develop knowledge, understanding and skills in a range of core Computer Aided Draughting topics at SCQF level 8.

11 To develop a degree of specialisation within subject specific disciplines such as: Visualisation, Feature Based Modelling, Architectural CAD, Graphical Design, Manufacturing, Project Management, Product Design and Analysis.

The mandatory Units of the course aim to provide the essential practical skills and knowledge required for working in industry, with the optional subjects aimed at giving the candidate knowledge and skills in specialist CADD subjects through a range of industry specific routes. All candidates have the chance to develop communication and advanced IT knowledge and skills relevant to CADD related disciplines. The course also aims to provide a stepping-stone to further study ie Higher Education.

3.3 Target groups

This HND CADD Group Award will be suitable for a wide range of potential candidates including:

- School leavers
- Candidates studying related subject areas such as engineering, construction and design related disciplines at NC level
- Adult returners to education
- Candidates in employment who wish to enhance their career prospects
- People changing direction/seeking a career change
- Part-time candidates wishing to broaden skills and knowledge
- Candidates who wish to pursue a career in industries currently utilising the benefits of CADD technology as a CADD Technician, CADD Manager, Junior Designer, Designer, or Design Office Manager depending on experience
- Candidates who wish to pursue a career in education as Technical Teachers, College Lecturers or as a CADD Trainer

3.4 Employment opportunities

Candidates completing an HND CADD could expect to gain employment as a:

- CADD Technician
- Junior Designer/Designer, depending on experience, in a range of disciplines
- CADD Manager
- Architectural Technician

4 Access to Group Award

The access requirements are designed to ensure that no artificial barriers are created to prospective candidates.

Applicants come from a wide variety of backgrounds and experiences including school leavers, adult returners and industry users, some without formal qualifications and those who may have experienced social exclusion. The access for the Group Award is designed to encourage and support the social inclusion agenda by providing an entry route for applicants with both traditional and non-traditional entry profiles.

The opportunity to develop all Core Skills can be identified throughout the mandatory section of this Group Award. This gives further support to candidates with non-traditional entry profiles to succeed at this level.

Where English is not the first language of a prospective candidate, it is recommended that the candidate possesses English for Speakers of Other Languages at an appropriate level. If using a test such as IELTS or equivalent, an entry score of 5.5 or above would provide a sound linguistic basis for the candidate to attempt this level of course. Candidates should be asked to produce a certificate to verify this.

4.1 Recommended access

As with all SQA qualifications, access to the Award will be at the discretion of the delivering centre. The following recommendations are for guidance only.

4.2 Formal qualifications

Some examples of appropriate formal entry qualifications are specified below. They are not exhaustive or mutually exclusive and may be offered in a variety of combinations. Guidelines for entry to HNC CADD year 1 HND) are as follows:

- A National Certificate Group Award in related subject areas such as Engineering, Architecture, General Design at SCQF level 5 or above
- Possession of the Certificate in CAD (eg an SQA PDA Computer Aided Draughting and Design award at SCQF level 7)
- Possession of a suitable group of three or more Standard grades which could include English, Craft and Design and Graphical Communication (or equivalent)
- Possession of a Higher in Graphical Communication SCQF level 6 (or equivalent)
- An HNC in a related discipline eg Engineering, Architecture
- CAD qualifications from other awarding bodies

- possession of a degree in a suitable discipline

Accreditation of prior experiential learning or alternative formal qualifications will be examined on an individual candidate basis by centres.

4.3 Entry to Year 2 HND

In order to achieve the HND in CADD candidates must gain 30 credits. While ideally full-time candidates should be encouraged to achieve 15 credits in each year ie the 12 mandatory credits which make up the HNC plus three optional credits, wider access should be provided to cater for the needs of those, for example, who have achieved the HNC at day release or evening classes or in other colleges.

4.4 Core Skills Entry profile

The following tables give information on the recommended Core Skills entry levels.

Core Skill	**Recommended Entry level**
Communication	SCQF level 5
Information Technology	SCQF level 5
Numeracy	SCQF level 5
Problem Solving	SCQF level 5
Working with Others	SCQF level 4

The framework for the award is designed to provide opportunities for developing and tailoring relevant elements of the Core Skills to the specific demands of the vocational area. A discrete Unit in Communication has been included in the framework which allows contextualised opportunities for Core Skills enhancement.

Candidates who achieve the year 1 of the HND CADD Group Award (ie the HNC CADD Group Award) will have had opportunities to develop Core Skills to the following levels:

Core Skill	**Recommended Entry level**
Communication	SCQF level 6
Information Technology	SCQF level 6
Numeracy	SCQF level 6
Problem Solving	SCQF level 6
Working with Others	SCQF level 6

Core Skill elements are signposted in Appendix 1. Each Unit specification details the opportunities for development of Core Skills in the Support Notes.

4.5 Work experience

Candidates with suitable relevant work experience may be accepted for entry provided the enrolling centre believes that they are likely to benefit from undertaking the award. In this subject-area it is common for candidates to already have some experience of CADD in industry, especially part-time candidates who may be supported by an employer.

5 Group Award Structure

The structure of the HND Computer Aided Draughting and Design award is split into mandatory and optional Units. Details of the Units are given in the tables below.

5.1 Mandatory framework

Mandatory framework for Years 1 and 2:

Mandatory Units — Year 1

Unit title	Code	SCQF credit points	SCQF level	SQA credit value
Communication: Practical Skills	H7MB 34*	8	7	1
CAD: 2D I	DW1E 34	8	7	1
CAD: 2D II	DW12 34	8	7	1
CAD: 3D Modelling	DW13 34	16	7	2
CAD: User Systems	DW14 34	8	7	1
CAD: Principles	DW16 34	8	7	1
Design Methodology	DW17 34	8	7	1
CAD: Visualisation, Rendering and Presentation	DW18 34	8	7	1
CAD: Feature Based Modelling 1	DW19 34	8	7	1
Computer Aided Draughting and Design: Graded Unit 1	DW15 34	8	7	1
Total mandatory Unit credits required (Year 1)				**11**

*Refer to History of Changes Table (above) for revision changes.

Mandatory Units — Year 2

Unit title	Code	SCQF credit points	SCQF level	SQA credit value
CAD: Feature Based Modelling 2	F217 35	16	8	2
CAD: Prototyping	F219 35	16	8	2
Project Management	D76J 35	8	8	1
CAD: 3D Animation	F214 35	16	8	2
CAD: Manufacturing	F218 35	16	8	2
Computer Aided Draughting and Design: Graded Unit 2	F328 35	16	8	2
Total mandatory Unit credits required (Year 2)				**11**

Optional Units

In addition to the mandatory Units a minimum of 8 additional credits are required.

Optional Units (8 credits — 4 in Year 1 and 4 in Year 2)

Unit title	Code	SCQF credit points	SCQF level	SQA credit value
CAD: Analysis	F215 35	8	8	1
CAD: Customised Programming	F216 35	16	8	2
CAD: Technical Illustration	F213 35	16	8	2
Computer Aided Engineering (CAE) and Prototyping	DR1R 35	16	8	2
CAD: Sheet Metal	F21A 35	8	8	1
Design for Manufacture	DR3M 35	8	8	1
CAD: Systems Management	DW1A 34	16	8	2
CAD: Graphical Design	DW1C 34	8	7	1
CAD: Architectural 1	DW1D 34	8	7	1
Architectural CADT: Principles and Practice	F32A 34	16	7	2
Architectural CADT: Residential Design	F329 34	16	7	2
CADD Skills	F8LW 34	16	7	2
Total optional Unit credits required				**8**

For a candidate to achieve the award of HND Computer Aided Draughting and Design, they would require to successfully complete the 22 mandatory credits plus 8 optional Unit credits. Centres may choose the delivery structure to meet their individual requirements.

5.1.1 Graded Units

The purpose of the Graded Units is to assess the candidate's ability to integrate and apply the knowledge and/or skills gained in the individual Units in order to demonstrate that they have achieved the principal aims of the qualifications.

Both Graded Units are project based Graded Units. This encourages candidates to demonstrate and develop transferable key skills to a level which will facilitate progress in education or industry.

5.1.2 Recommended Entry and Exit levels for Core Skills

The table below gives the recommended entry and exit levels for the Core Skills.

Core Skills	Recommended Entry level HNC (Year 1 HND)	Recommended Exit level (HNC/HND)
Communication	SCQF 5	SCQF 6
Information Technology	SCQF 5	SCQF 6
Numeracy	SCQF 5	SCQF 6
Problem Solving	SCQF 5	SCQF 6
Working with Others	SCQF 4	SCQF 6

Opportunities to develop Core Skills are signposted in the individual Unit specifications. Appendix 1 provides Core Skill mapping information.

5.2 Mapping information

All of the mandatory Units undertake the generic aims (1-6) of the award.

The table below shows how each of the mandatory Units meets the specific aims of the award.

Product code	Unit title	Aims being met
D77G 34	Communication: Practical Skills	7, 8, 9
DW1E 34	CAD: 2D I	7, 8
DW12 34	CAD: 2D II	7, 9
DW13 34	CAD: 3D Modelling	11
DW14 34	CAD: User Systems	7
DW16 34	CAD: Principles	7
DW17 34	Design Methodology	11
DW15 34	Computer Aided Draughting and Design: Graded Unit 1	7
DW18 34	CAD: Visualisation, Rendering and Presentation	9
DW19 34	CAD: Feature Based Modelling 1	7, 11
F217 35	CAD: Feature Based Modelling 2	10, 11
F219 35	CAD: Prototyping	9, 10
D76J 35	Project Management	11
F214 35	CAD: 3D Animation	9
F218 35	CAD: Manufacturing	7, 10
F328 35	Computer Aided Draughting and Design: Graded Unit 2	9

The optional Units are also designed to meet some of the specific aims:

Product code	Unit title	Aims being met
F215 35	CAD: Analysis	10, 11
F216 35	CAD: Customised Programming	11
F213 35	CAD: Technical Illustration	9
DR1R 35	Computer Aided Engineering (CAE) and Prototyping	11
F21A 35	CAD: Sheet Metal	11
D3RM 35	Design for Manufacture	9
DW1A 34	CAD: Systems Management	11
DW1C 34	CAD: Graphical Design	7
DW1D 34	CAD: Architectural 1	7, 11
F32A 34	Architectural CADT: Principles and Practice	7
F329 34	Architectural CADT: Residential Design	11

5.2.1 Mapping to National Occupation Standards

The occupational standard setting body for Computer Aided Draughting and Design is SEMTA (Science, Engineering and Manufacturing Technologies).Following government initiatives to strengthen the input of Sector Skill bodies and ensure that they hold a more prominent position within the development and structure of vocational awards, the Units within the HND CADD have been mapped against the relevant occupational standards, ensuring that occupational training requirements are met and further developed within the HND CADD

There are seven SEMTA Units that are considered level 3 occupational standard covering eight functional areas of Computer Aided Draughting and Design. The table detailed in Appendix 2 presents an overview of the standards for these eight functional areas against relevant Units and Outcomes from the SQA HNC/HND Computer Aided Draughting and Design Group Award. The alignment of the SEMTA Units to the HND framework has been verified and scrutinised by SEMTA

The SQA Unit CAD: Principles is the one SQA Unit that could be aligned against seven out of the eight SEMTA Units. However, it is considered highly unlikely that all of the seven SEMTA Units be covered using the CAD: Principles Unit. Candidates on the HND CADD course could cover a broad variety of different drawing types while working through the content of the CAD: Principles Unit. In particular, Outcome 4 of the CAD: Principles Unit could include learning and teaching in; Electrical Engineering drawings (SEMTA Unit: 6); Electronic Engineering drawings (SEMTA Unit: 7); Fluid Power Engineering drawings (SEMTA Unit: 6); Systems/Services Engineering Drawings (SEMTA Unit: 6). However, candidates will only be assessed on one of the listed topics, this being at the discretion of the delivering centre.

The HND Computer Aided Draughting and Design Group Award content covers all aspects of the SEMTA occupational standards providing the identified SQA HN Units are delivered with an engineering bias.

5.3 Articulation, professional recognition and credit transfer

5.3.1 Articulation to Higher Education

Whilst agreements have been made with two Higher Education Establishments for progression of successful candidates on to university, these must be pursued on a centre by centre basis.

- University of Paisley 3rd year entry to BSc(Hons) Computer Aided Draughting and Design
- Napier University BSc 2nd year entry to BSc(Hons) Architectural Technology

Other Higher Educations Establishments that have accepted successful HND CADD candidates on to a variety of courses include:

- University of Strathclyde
- Glasgow Caledonian University
- University of Stirling

The HND award delivers the most appropriate grouping of Units according to the candidate's needs and planned progression routes. Further articulation opportunities will be sought as the course matures.

Candidates should be advised to liaise directly with the HE establishments prior to application as Unit credits that count towards entry requirements can vary.

5.3.2 Credit transfer

The following arrangements show the alternative route to certification, which will **only** be available to candidates who have already completed a 'predecessor' HNC/first year HND and should **not** be offered to any new candidates. Candidates should

- be given credit transfer between HNC/HND Units (developed using 1988 design principles) and the new HN Units (developed using 2003 design principles)
- achieve HNC CAD Graded Unit 1 of 8 SCQF points at level 7
- be given opportunities to develop Core Skills as recommended

Credit transfer can be given where there is broad equivalence between subject related content of the Unit (or combination of Units).

Candidates who are given credit transfer between current HNC/HND Units and the new HN Units must still satisfy all other conditions of award of the new principles HNC/HND including the mandatory Units and the correct number of credits at the correct SCQF level.

A credit transfer grid is included in Appendix 3 and details information on credit transfer between the Units of the previous HND CADD award and the Units of the new HND CADD award. The credit transfer grid is designed to make it as straightforward as possible for course tutors to assess the level of credit transfer from previous to new Units and details the arrangement for an alternative route for candidates transferring from predecessor HNC/first part HND to second part of revised HND.

All candidates transferring from old HNC or HND year 1 award to the second year of the new HND award must complete CAD Graded Unit 1.

6 Approaches to delivery and assessment

6.1 Content and context

The HND CADD is designed to equip candidates with the knowledge, understanding and skills required for success in current and future employment within CADD related industries.

All of the Units listed in the framework may be delivered as stand-alone qualifications. Alternatively, they may be included in a variety of Group Awards as mandatory or optional Units. Where they are delivered within a specified framework, as in this HND CADD framework, they constitute a coherent, attractive and very relevant programme designed as 'fit for purpose' to equip candidates with the knowledge and skills needed for today's working environment.

The awards can be delivered in many different modes of attendance including full-time, part-time and flexible learning patterns. Delivering centres are responsible for ensuring authenticity of candidate's work.

Whilst one of the main aims of the award is to prepare candidates to successfully enter their chosen vocational sector, one important secondary aim of the award is to enable candidates to access opportunities to further academic and/or professional qualifications.

6.2. Delivery

A variety of teaching and learning approaches can be used in the delivery of the course. These may include lectures, demonstrations, worked examples and candidate exercises. The use of open and distance learning material and on-line materials may help to supplement and support the learning that takes place in the classroom/CAD lab. Industrial visits are encouraged along with input from guest speakers.

The structure of the qualification allows for a high degree of flexibility in the delivery modes. This is a key strength of the award and meets the needs of employers.

The award can be offered on a full-time standard, full-time fast track, day release, evening or flexible learning mode. In addition, it is also possible (and becoming increasingly popular) to offer the qualification using a combination of modes. Such combination of study modes may enable candidates to complete the award within a shorter time period. It is also possible for centres to offer individual Units on an open learning or e-line basis especially if there is the possibility of home based study of more factual based information

Part time delivery may fall into one or more of the following patterns:

- Discrete part time HNC/D courses run over a period of 3 to 5 years
- Clusters of specialised Units taught as short courses
- Tailored provision
- PDA Computer Aided Draughting and Design

6.3 Sequence of delivery

Although centres can choose in what order to teach the Units an exemplar delivery schedule for both years of full-time delivery has been produced (see Appendix 4). Appendix 4 also gives a sample delivery schedule for part-time delivery.

6.4 Assessment

The overall assessment strategy under the new Design Principles is to encourage a more holistic approach to assessment. The new HN Unit Specification places the emphasis on assessing the whole Outcome or a combination of Outcomes. The new Unit specification allows the use of 'sampling' of knowledge and/or skills thereby reducing the assessment load for both candidates and centres.

The HND CADD programme offers a number of opportunities to take an integrated approach to the generation of evidence to match the assessment requirements of the individual Units. A portfolio-based approach could help facilitate such integration eg 2D assessments could be developed and used for any 3D work and further used in visualisations etc.

Unit specifications detail exactly the Evidence Requirements and assessment procedures for each assessment event. Exemplar assessment instruments have been produced for mandatory Units which indicate to centres what is required from the assessment instrument. Centres can use the exemplars for assessment purposes as long as they are keep secure but are expected to use these as a template for producing further assessments.

6.4.1 Assessment on demand opportunities

Individual candidates may be offered assessment on demand opportunities on a Unit-by-Unit basis where they can evidence prior knowledge and skills in the subject. Individual centres should ensure that any assessment on demand opportunities identified meet the Unit specification and Evidence Requirements as well as both the SQA and institution's assessment on demand policies.

6.4.2 Assessment Integration Opportunities

The following table details a number of examples where integration of assessment may be achieved.

Examples of Integration Opportunities
CAD: Visualisation Outcome 1 can be integrated with CAD: Feature Based Modelling 1 Outcomes 2 and 3. The models created for the Feature Based Modelling assessments can be used for Outcome 1 of the Visualisation Unit.
CAD: Visualisation Outcome 1 can be partially integrated with CAD: 3D Modelling Outcomes 2 and 3. Additional models would need to be created to fully satisfy the requirements of Outcome 1 of the Visualisation Unit.
CAD: 2D I can be fully integrated with CAD: Principles. One set of assessments could be used to satisfy both Units. However, it is stressed that the focus for the CAD: 2D I Unit is the learning of practical 2D CAD skills and familiarisation of the CAD system, these contrasts to the CAD: Principles Unit which focuses on setting and working to standards.

Individual delivering centres are encourages to integrate assessment where possible.

Any extra time saved by integration of assessments could be spent on reinforcing Core Skill elements or increasing employability skills and exposure to working CADD environments.

6.5 Open/Distance Learning

Where Distance Learning is concerned, the following methods of delivery could be employed to convey the information required:

- Printed tutorials could be posted
- Electronic copy of the tutorials could be accessed via email or web.
- Tutorials accessed through a Virtual Learning Environment (VLE)

Information regarding open/flexible learning delivery is contained within each Unit specification. The introduction of 'sampling' within the assessment strategy means that more assessment may now be carried out in 'controlled conditions'. Centres must have procedures in place to authenticate the work produced by candidates who do not undertake assessment within the Centre. This could be in the form of the candidate being spoken to over the telephone by the lecturer, and when asked key questions about the assessments, should be able to communicate/confirm how the work was achieved etc. Where candidates are assessed on oral presentation, the submission of a video recording of the presentation or group meeting is considered to be a satisfactory method of evidencing this type of element.

6.6 Re-assessment

The way that centres manage re-assessment of candidates, is centre specific and will be subject to internal verification procedures. To ensure that the assessment process is as holistic as possible and that assessors are able to effectively judge candidates' performance in the Outcome or Unit as a whole, it may not always be possible to reassess only those parts of the performance in which candidates have not satisfactorily demonstrated competence. Scenarios where candidates may need to undertake the whole assessment include:

- assessments which test knowledge and other cognitive skills and where it may not
- be possible to extract some of the items for reassessment
- where parts of several Outcomes are involved
- where a project has been designed as an integrated assessment and where there is a requirement to complete the project as a single complex task.

Candidates may require to do only part of an assessment, where their evidence has been generated over a period of time and/or a discrete part of the Unit, such as an Outcome, has been assessed originally.

6.7 Resource requirements

Centres choosing to deliver the HND CADD will require high-end computer hardware specifications and appropriate software packages.

7 General information for centres

Candidates with disabilities and/or additional support needs

The additional support needs of individual candidates should be taken into account when planning learning experiences, selecting assessment instruments, or considering alternative Outcomes for Units. Further advice can be found in the SQA document *Guidance on Assessment Arrangements for Candidates with Disabilities and/or Additional Support Needs* **(www.sqa.org.uk)**.

Internal and external verification

All instruments of assessment used within this/these Group Award(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 and Quality Assurance for Colleges of Further Education* **(www.sqa.org.uk)**.

8 General information for candidates

The award of HND CADD is designed to meet the demands and requirements of today's modern working environment. Opportunities are provided for you to develop skills and knowledge required for the specialist areas of employment in engineering, construction and design related industries.

To achieve the award you must achieve 30 Unit credits. There are 22 mandatory credits and 8 optional credits. The inclusion of a wide variety of options is to ensure that provision can be made to match both local employer demands and provide opportunities for you to develop your individual abilities and interest.

Many of the Unit assessments require research, design and application of your practical skills.

There are two Graded Units within the Group Award for HND CADD. These Graded Units are used to assess your ability to integrate and apply your knowledge and skills, and to demonstrate that you have achieved the principal aims of the Group Award. A single credit Graded Unit at SCQF level 7 will be assessed in year one and a 2-credit Graded Unit at SCQF level 8 will be assessed in year two. Both Graded Units are project based practical assignments.

On completion of your course, a range of employment opportunities will be available eg:

- CADD technician
- Junior Designer/Designer (depending on experience)
- CADD Manager
- Education

You may decide to work freelance or use your entrepreneurial skills to take advantage of opportunities which may arise.

Progression to HE should be possible, but this will be at the discretion of the selected institute. The HND CADD award provides progression routes to a range of HEIs including:

- University of Paisley - BSc (Hons) Computer Aided Draughting and Design (Year 3)
- Napier University - BSc (Hons) Architectural Technology (Year 2).

9 Glossary of terms

SCQF: This stands for the Scottish Credit and Qualification Framework, which is a new way of speaking about qualifications and how they inter-relate. We use SCQF terminology 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: One HN credit is equivalent to 8 SCQF credit points. This applies to all HN Units, irrespective of their level.

SCQF levels: The SCQF covers 12 levels of learning. HN Units will normally be at levels 6–9. Graded Units will be at level 7 and 8.

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

Graded Unit: Graded Units assess candidates' 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 candidates to retain and adapt their skills and knowledge.

Dedicated Core Skill Unit: This is a Unit that is written to cover one or more particular Core Skills, eg HN Units in Information Technology or Communications.

Embedded Core Skills: This is where the development of a Core Skill is incorporated into the Unit and where the Unit assessment also covers the requirements of Core Skill assessment at a particular level.

Signposted Core Skills: This refers to the opportunities to develop a particular Core Skill at a specified level that lie outwith automatic certification.

Qualification Design Team: The QDT works in conjunction with a Qualification Manager/Development Manager to steer the development of the HNC/D from its inception/revision through to validation. The group is made up of key stakeholders representing the interests of centres, employers, universities and other relevant organisations.

Consortium-devised HNCs and HNDs are those developments or revisions undertaken by a group of centres in partnership with SQA.

Specialist single centre and specialist collaborative devised HNCs and HNDs are those developments or revisions led by a single centre or small group of centres who provide knowledge and skills in a specialist area. Like consortium-devised HNCs and HNDs, these developments or revisions will also be supported by SQA.

10 Appendices

Appendix 1: Core Skills mapping
Appendix 2: SEMTA mapping
Appendix 3: Credit transfer grid
Appendix 4: Sample delivery schedules

Appendix 1: Core Skills mapping

The HND Computer Aided Draughting and Design award has been designed using the new HN Design Principles and therefore the importance of Core Skills has been recognised and been incorporated, where appropriate, throughout the award. The following table is a summary of where the five Core Skill elements are signposted fore possible development.

Unit title	**Communication**			**Numeracy**		**Information Technology**	**Problem Solving**			**Working with Others**
	Read	**Write**	**Oral**	**Using Number**	**Using Graphical Information**	**Using Information Technology**	**CT**	**P&O**	**R&E**	**Working with Others**
Communication: Practical Skills	√	√	√			√				√
CAD: 2D I				√		√				
CAD: 2D II				√		√	√	√	√	
CAD: 3D Modelling					√		√	√	√	
CAD User Systems		√		√		√	√	√	√	
CAD Principles				√	√	√	√	√	√	
Design Methodology	√	√					√	√	√	√
Graded Unit 1	√	√	√	√	√	√	√	√	√	

Unit title	Communication			Numeracy		Information Technology	Problem Solving			Working with Others
	Read	Write	Oral	Using Number	Using Graphical Information	Using Information Technology	CT	P&O	R&E	Working with Others
CAD: Visualisation, Rendering and Presentation			√			√				
CAD: Feature Based Modelling 1				√	√	√				
CAD Systems Management	√	√				√				
CAD: Graphical Design					√	√				
CAD: Architectural CAD 1				√	√	√				
Design for Manufacture			√			√				√
CAD: Manufacturing					√	√	√	√		
CAD: 3D Animation					√	√	√	√		
CAD: Prototyping	√	√			√	√		√	√	
Project Management		√			√	√				
CAD: Feature Based Modelling 2				√	√	√	√			
Graded Unit 2	√	√	√	√	√	√	√	√	√	
CAD: Sheet Metal		√			√	√	√	√		
CAD: Analysis				√	√	√	√	√	√	
CAD: Technical Visualisation	√					√	√		√	
CAD: Programming	√	√		√	√	√	√			
Arch CAD: Principles and Practice				√	√	√	√	√	√	
Arch CAD: Residential Design				√	√	√	√	√	√	

Appendix 2: SEMTA mapping

SEMTA Occupational Standards Unit	Relevant SQA Units	Notes
Unit No 4: Producing Mechanical Engineering Drawings using Computer Aided Techniques	CAD: Principles CAD:2D I CAD:2D II Design Methodology CAD:3D Modelling CAD: Feature Based Modelling	All aspects of SEMTA Unit No: 4 could be covered when delivering SQA Unit CAD: Principles.
Unit No 5: Producing Engineering Drawings/Models using 3D Computer Aided Techniques	CAD:3D Modelling CAD: Feature Based Modelling	All aspects of SEMTA Unit No: 5 could be covered when delivering SQA Unit CAD: 3D Modelling. Partial coverage could be achieved through delivery of CAD: Feature Based Modelling.
Unit No 6: Producing Electrical Engineering Drawings using Computer Aided Techniques	CAD: Principles CAD:2D I CAD:2D II Design Methodology CAD:3D Modelling CAD: Feature Based Modelling	All aspects of this SEMTA Unit No: 6 could be covered when delivering SQA Unit CAD: Principles (mainly Outcome 4). The HNC CADD framework contains SQA Units, which when taught collectively, could provide opportunity to develop skills and knowledge towards the occupational standard. (See list)
Unit No 7: Producing Electronic Engineering Drawings using Computer Aided Techniques	CAD: Principles CAD:2D I CAD:2D II Design Methodology CAD:3D Modelling CAD: Feature Based Modelling	All aspects of this SEMTA Unit No: 7 could be covered when delivering SQA Unit CAD: Principles (mainly Outcome 4). The HNC CADD framework contains SQA Units, which when taught collectively, could provide opportunity to develop skills and knowledge towards the occupational standard. (See list)
Unit No 8: Producing Fabrication/Engineering Engineering Drawings using Computer Aided techniques	CAD: Principles CAD:2D I CAD:2D II Design Methodology CAD:3D Modelling CAD: Feature Based Modelling	All aspects of this SEMTA Unit No: 8 could be covered when delivering SQA Unit CAD: Principles (mainly Outcome 4). The HNC CADD framework contains SQA Units, which when taught collectively, could provide opportunity to develop skills and knowledge towards the occupational standard. (See list)
Unit No 9: Producing Fluid Power Engineering Drawings using Computer Aided techniques	CAD: Principles CAD:2D I CAD:2D II Design Methodology CAD:3D Modelling CAD: Feature Based Modelling	All aspects of this SEMTA Unit No: 9 could be covered when delivering SQA Unit CAD: Principles (mainly Outcome 4). The HNC CADD framework contains SQA Units, which when taught collectively, could provide opportunity to develop skills and knowledge towards the occupational standard. (See list)
Unit No 10: Producing Engineering Systems/Services Drawings using Computer Aided techniques	CAD: Principles CAD:2D I CAD:2D II Design Methodology CAD:3D Modelling CAD: Feature Based Modelling	All aspects of this SEMTA Unit No: 10 could be covered when delivering SQA Unit CAD: Principles (mainly Outcome 4). The HNC CADD framework contains SQA Units, which when taught collectively, could provide opportunity to develop skills and knowledge towards the occupational standard. (See list)

Appendix 3: Credit transfer grid

OLD HN CADD UNITS			NEW HN CADD UNITS		
Unit number	**Unit title**	**Credits**	**Unit number**	**Unit title**	**Credits**
D4FW 04	Computer Aided Draughting	1	DW1E 34 & DW16 34	CAD: 2DI & CAD: Principles	2
D4G3 04 & D2J3 04	Computerised 3D Modelling and Solid Modelling	3	DW13 34	CAD: 3D Modelling	2
D2J2 04	Operating Systems for CAD Users	1	DW14 34	CAD: User Systems	1
D2J4 04	CADD Project	2	DW17 34	Design Methodology	1
D9V7 04	Feature Based Modelling: An Introduction	1	DW19 34	CAD; Feature Based Modelling I	1
D2J5 04	CAD Systems Management	2	DW1A 34	CAD Systems Management	2
D2JA 04	Computer Aided Graphical Design	1	DW1C 34	CAD: Graphical Design	1
D9V9 04	Architectural CAD: AN Introduction	1	DW1D 34	CAD: Architectural 1	1
A71E 04 & D9V8 04	Shading and Rendering or Rendering with Solids	1	DW18 34	CAD; Visualisation, Rendering and Presentation	1
A71D 04	3D Graphics and Animation	2	F214 35	CAD: 3D Animation	2
A3CM 04	Computer Graphics Programming	2	F216 35	CAD: Customised Programming	2
A3CH 04	Computer Graphics Packages	2	F213 35	CAD; Technical Illustration	2
Total HN credits		**20**	**Total HN credits**		**19**

Appendix 4: Sample timetables

The following timetables give a suggestion as to the order in which the Units of the HND CADD could be undertaken.

Full-time attendance — completing 30 credits inclusive of 22 mandatory credits and 8 optional credits.

Year 1

	09.00-10.30	10:45-12.15		13:00-14:30	14:45-16.15
Block 1 (Completing 5 credits)	**1**	**2**	**LUNCH**	**3**	**4**
	CAD: 2D I	**CAD: 2D I**		**CAD: User Systems**	**CAD: User Systems**
	Design Methodology	**Design Methodology**		**CAD: Principles**	**CAD: Principles**
	CAD: Graphical Design	**CAD: Graphical Design**			

	09.00-10.30	10:45-12.15		13:00-14:30	14:45-16.15
Block 2 (Completing 5 credits)	**1**	**2**	**LUNCH**	**3**	**4**
	CAD: 3D Modelling	**CAD: 3D Modelling**		**CAD: Visualisation, Rendering and Presentation**	**CAD: Visualisation, Rendering and Presentation**
	CAD: 2D II	**CAD: 2D II**		**CAD: 3D Modelling**	**CAD: 3D Modelling**
	Feature Based Modelling 1	**Feature Based Modelling 1**			

	09.00-10.30	10:45-12.15		13:00-14:30	14:45-16.15
	1	2		3	4
Block 3 (Completing 5 credits)	**CAD: Systems Management**	**CAD: Systems Management**	**LUNCH**	**Communication: Practical Skills**	**Communication: Practical Skills**
	CAD: Graded Unit	**CAD: Graded Unit**		**CAD: Systems Management**	**CAD: Systems Management**
	CAD: Architectural 1	**CAD: Architectural 1**			

Year 2

	09.00-10.30	10:45-12.15	LUNCH	13:00-14:30	14:45-16.15
	1	2		3	4
Block 1 (Completing 5 credits)	**CAD: Feature Based Modelling 2**	**CAD: Feature Based Modelling 2**		**CAD: Manufacturing**	**CAD: Manufacturing**
	Project Management	**Project Management**		**CAD: Manufacturing**	**CAD: Manufacturing**
	CAD: Feature Based Modelling 2	**CAD: Feature Based Modelling 2**			

	09.00-10.30	10:45-12.15	LUNCH	13:00-14:30	14:45-16.15
	1	2		3	4
Block 2 (Completing 5 credits)	**CAD: Prototyping**	**CAD: Prototyping**		**CAD: 3D Animation**	**CAD: 3D Animation**
	CAD: Programming	**CAD: Programming**		**CAD: 3D Sheet Metal Design**	**CAD: 3D Sheet Metal Design**
	CAD: 3D Animation	**CAD: 3D Animation**			

	09.00-10.30	10:45-12.15	LUNCH	13:00-14:30	14:45-16.15
	1	2		3	4
Block 3 (Completing 5 credits)	**CAD: Programming**	**CAD: Programming**		**CAD: Technical Visualisation**	**CAD: Technical Visualisation**
	CAD Graded Unit 2	**CAD Graded Unit 2**		**CAD: Technical Visualisation**	**CAD: Technical Visualisation**
	CAD Graded Unit 2	**CAD Graded Unit 2**			

Part-time attendance — completing 30 credits inclusive of 22 mandatory credits and 8 optional credits.

Year 1

	09.00-10.30	10:45-12.15		13:00-14:30	14:45-16.15
	1	2		3	4
Block 1 (Completing 2 credits)	**CAD: 2D I**	**CAD: 2D I**	**LUNCH**	**CAD: User Systems**	**CAD: User Systems**

	09.00-10.30	10:45-12.15		13:00-14:30	14:45-16.15
	1	2		3	4
Block 2 (Completing 2 credits)	**Design Methodology**	**Design Methodology**	**LUNCH**	**CAD: Graphical Design**	**CAD: Graphical Design**

	09.00-10.30	10:45-12.15		13:00-14:30	14:45-16.15
	1	2		3	4
Block 3 (Completing 2 credits)	**CAD: 3D Modelling**	**CAD: 3D Modelling**	**LUNCH**	**CAD: 3D Modelling**	**CAD: 3D Modelling**

Year 2

	09.00-10.30	10:45-12.15		13:00-14:30	14:45-16.15
	1	2		3	4
Block 1 (Completing 2 credits)	**CAD: FBM I**	**CAD: FBM I**	**LUNCH**	**CAD: Architectural CAD I**	**CAD: Architectural CAD I**

	09.00-10.30	10:45-12.15		13:00-14:30	14:45-16.15
	1	2		3	4
Block 2 (Completing 2 credits)	**CAD: Principles**	**CAD: Principles**	**LUNCH**	**Communication: Practical Skills**	**Communication: Practical Skills**

	09.00-10.30	10:45-12.15		13:00-14:30	14:45-16.15
	1	2		3	4
Block 3 (Completing 2 credits)	**CAD: Graded Unit**	**CAD: Graded Unit**	**LUNCH**	**CAD: Visualisation, Rendering and Presentation**	**CAD: Visualisation, Rendering and Presentation**

Year 3

	09.00-10.30	10:45-12.15		13:00-14:30	14:45-16.15
	1	2		3	4
Block 1 (Completing 2 credits)	**CAD: Systems Management**	**CAD: Systems Management**	**LUNCH**	**CAD: 2D II**	**CAD: 2D II**

	09.00-10.30	10:45-12.15		13:00-14:30	14:45-16.15
	1	2		3	4
Block 2 (Completing 2 credits)	**CAD: Systems Management**	**CAD: Systems Management**	**LUNCH**	**Project Management**	**Project Management**

	09.00-10.30	10:45-12.15		13:00-14:30	14:45-16.15
	1	2		3	4
Block 3 (Completing 2 credits)	**CAD: Feature Based Modelling 2**	**CAD: Feature Based Modelling 2**	**LUNCH**	**CAD: Feature Based Modelling 2**	**CAD: Feature Based Modelling 2**

Year 4

	09.00-10.30	10:45-12.15		13:00-14:30	14:45-16.15
	1	2		3	4
Block 1 (Completing 2 credits)	**CAD: Manufacturing**	**CAD: Manufacturing**	**LUNCH**	**CAD: Prototyping**	**CAD: Prototyping**

	09.00-10.30	10:45-12.15		13:00-14:30	14:45-16.15
	1	2		3	4
Block 2 (Completing 2 credits)	**CAD: Manufacturing**	**CAD: Manufacturing**	**LUNCH**	**CAD: Programming**	**CAD: Programming**

	09.00-10.30	10:45-12.15		13:00-14:30	14:45-16.15
	1	2		3	4
Block 3 (Completing 2 credits)	**CAD: Programming**	**CAD: Programming**	**LUNCH**	**CAD: Graded Unit**	**CAD: Graded Unit**

Year 5

	09.00-10.30	10:45-12.15		13:00-14:30	14:45-16.15
	1	2		3	4
Block 1 (Completing 2 credits)	**CAD: 3D Sheet Metal Design**	**CAD: 3D Sheet Metal Design**	**LUNCH**	**CAD: Graded Unit**	**CAD: Graded Unit**

	09.00-10.30	10:45-12.15		13:00-14:30	14:45-16.15
	1	2		3	4
Block 2 (Completing 2 credits)	**CAD: 3D Animation**	**CAD: 3D Animation**	**LUNCH**	**CAD: Technical Visualisation**	**CAD: Technical Visualisation**

	09.00-10.30	10:45-12.15		13:00-14:30	14:45-16.15
	1	2		3	4
Block 3 (Completing 2 credits)	**CAD: 3D Animation**	**CAD: 3D Animation**	**LUNCH**	**CAD: Technical Visualisation**	**CAD: Technical Visualisation**