



Arrangements for:
**HNC Computer Aided Draughting and
Design**

Group Award Code: G868 15

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Acknowledgement

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

Contents

History of changes.....	1
1 Introduction.....	2
2 Rationale for the revision of the award.....	2
2.1 Consultation with FE Colleges.....	2
2.2 Consultation with Industry.....	3
2.3 SQA Statistics.....	3
2.4 Candidates.....	4
3 Aims of the award.....	4
3.1 General aims of the award.....	4
3.2 Specific aims of the award.....	4
3.3 Subject specific aims of the HNC award.....	5
3.4 Target groups.....	5
3.5 Employment opportunities.....	5
3.6 Articulation.....	6
4 Access to awards.....	6
5 Award structure.....	6
5.1 Framework.....	7
5.2 Core Skills Entry Level.....	7
5.3 Core Skills Exit Level.....	8
5.4 Mapping information.....	9
5.5 Mapping to National Occupational Standards.....	9
5.6 Articulation, professional recognition and credit transfer.....	10
6 Approaches to delivery and assessment.....	10
6.1 Content and Context.....	10
6.2 Delivery.....	11
6.3 Assessment.....	11
6.4 Open and Distance Learning.....	12
6.5 Assessment Exemplars.....	13
6.6 Resource requirements.....	13
7 General information for centres.....	13
8 General information for candidates.....	14
9 Glossary of terms.....	15
10 Appendices.....	16
Appendix 1.....	17
Appendix 2.....	21
Appendix 3.....	23
Appendix 4.....	31
Appendix 5.....	34
Appendix 6.....	37
Appendix 7.....	40

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. Revision of Unit: DE1K 33 Workplace Communication in English has been replaced by H8T2 33 and will finish 31/07/2016	08/05/2015
02	Page 38 — CAD Systems Management status amended from 'Partial (Does not include Outcome 4 of new Unit)' to Partial (Does not include Outcome 3 of new Unit)	17/04/08

1 Introduction

This is the Arrangements document for the revised Group Award in Computer Aided Draughting and Design, which was validated in December 2005. 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.

The HNC Computer Aided Draughting and Design (referred to as CADD) course was originally validated in May 1994. The course was developed to meet the needs of local industry which required suitably capable and qualified personnel to have the necessary skills to satisfy the growth in CAD related disciplines. These new skills emerged as a result of technological developments in both computer hardware and software which in turn resulted in very powerful computer based draughting systems.

Since its original validation, the qualification has proved popular not only in Scotland but in a number of centres in England. There are various modes of delivery, with full-time and part-time day/evening being the most popular. The distance-learning mode also proves popular with candidates in employment.

Within the lifespan of the original qualification, several of the original Units were re-written. Hardware and software developments had rendered some of the Units obsolete and new CADD concepts not available at the time of the original validation were introduced into the framework. However, the HN Modernisation programme has also given the opportunity to:

- (a) review the course framework
- (b) introduce new Units relevant to industry needs
- (c) further update existing Units
- (d) remove obsolete Units and concepts

The HNC CADD development has resulted in a new award structure that has been designed to provide candidates with the opportunity to develop a high level of practical CADD skills matching the needs of industries currently using CADD technology.

2 Rationale for the revision of the award

It is the belief of the Qualification Design Team that Computer Aided Draughting and Design is an integral part of the design process for many industries. The purpose of the HNC Computer Aided Draughting and Design Group Award is to produce highly skilled and knowledgeable CADD specialists, who can work to a proficient and competent level as CAD technician/operators or Junior Designers.

The market research undertaken as part of the HNC CADD development has shown that there is a need for competent CADD staff in many industries. The market research consultation looked at a variety of sources including FE Colleges, Industry, candidates currently studying towards HNC CADD (old style), SQA enrolment statistics and National Occupational Standards.

2.1 Consultation with FE Colleges

Following the introduction of the new HN Design rules, SQA carried out an initial consultation with FE colleges to gain feedback on the existing HNC CADD. A questionnaire was circulated to FE Colleges and appropriate External Moderators. The responses showed that the current framework:

- ◆ meets the needs of full-time and part-time candidates
- ◆ allows for articulation to higher level qualifications
- ◆ requires updating to reflect advances in CAD software

Feedback from the initial FE consultation provided a strong measure of support for the existing qualification although at the same time highlighting the need to update it.

Following the initial consultation a Qualification Steering Group and Qualification Design Team were established. Members of both groups came from centres delivering the existing qualification as well as centres potentially interested in the new award and both groups met regularly throughout the development of the revised qualification. The following bullet points list the main issues discussed:

- ◆ an overview of Engineering developments and new HN Design Principles
- ◆ the uptake of the existing HNC award
- ◆ the component Units of the HNC CADD award
- ◆ the future of the PDA award: Certificate in CAD
- ◆ entry into and progression from the HNC award
- ◆ cross-sectoral issues

The Outcome of these discussions was that:

- ◆ there is a requirement for the HNC CADD award to continue
- ◆ the existing framework requires updating
- ◆ there is a requirement for a new PDA award: Certificate in CADD (based on constituent Units of the HNC)

2.2 Consultation with Industry

To ascertain the needs of industry, an SQA questionnaire was sent to various industrial contacts identified by the Steering Group. This represented a good spread of relevant industries. An overview of the consultation is detailed in Appendix 1.

In addition, and in order to verify the feedback from Industry, desk-based research was undertaken by gathering and analysing data from various sources eg Sector Skills Council for Science, Engineering and Manufacturing Technologies (SEMTE) and Future Skills Scotland etc. Extracts from the SEMTE data is included in Appendix 2.

The industry consultation confirmed that there is a continued demand for the Computer Aided Draughting and Design course. Industry continues to acknowledge a skills gap in the work force, and a need for specialist training in Computer Aided Draughting and Design. This is also identified in the SEMTE Labour Market intelligence report.

2.3 SQA Statistics

SQA entry and certification data also provides a clear indication of the continuing demand for an HNC Computer Aided Draughting and Design award. Data for the last five years is as follows:

HNC	2001	2002	2003	2004	2005	Total
Entries	111	187	126	131	128	684
Awards	69	94	100	73	79	423

It can be seen from the above data that there continues to be a strong demand for the HNC Computer Aided Draughting and Design award, justifying a national development overall.

2.4 Candidates

Candidates currently studying, or who have studied, the HNC CADD award gave very positive feedback on the suitability of the course in relation to industry. They provided responses on how they have progressed and are currently using their CADD skills and knowledge within an industrial setting.

Testimonials of former candidates have been included in Appendix 3. These include candidates who have progressed directly on to HND, university and employment after completing the current HNC CADD. This is a good indication of how the course has helped candidates succeed in the past.

3 Aims of the award

The aim of the HNC Computer Aided Draughting and Design Group Award is to provide candidates with the opportunity to develop a high level of practical CADD skills matching the needs of industries currently using CADD technology. Candidates will also develop knowledge and understanding of the design process and the stages of design where CADD can help in the achievement of a desirable design solution. The course will provide candidates with the opportunity to research CADD to gain an understanding of the industries in which CADD technology is being utilised eg Engineering design/manufacture, Architectural design, Product design, Furniture design, Interior design, Landscape design, Sign design, Jewellery design and Civil/Structural design, etc.

It is stressed that the course is not aimed at producing Design Engineers (although all Units could be delivered with an engineering bias), but the production of CADD specialists who will have a proficient level of understanding and knowledge of design, the design process and in particular Computer Aided Draughting and Design. On completion of the course, candidates should have a creditable comprehension of the role in which CADD plays in the design of a product, building, mechanical component, landscape development, etc.

3.1 General aims of the award

The general aims of the HNC award are to:

- 1 Enhance candidates' employment prospects.
- 2 Support candidates' Continuing Professional Development and career development.
- 3 Enable progression within the SCQF (Scottish Credit and Qualification Framework).
- 4 Develop candidates' ability to apply analysis and synthesis skills to the solution of Computer Aided Draughting and Design problems.
- 5 Develop learning and transferable skills (including Core Skills).

3.2 Specific aims of the award

The specific aims of the HNC award are to:

- 6 Provide an award that will allow candidates to work now, or in the future, as CAD technicians and draughtsmen.
- 7 Develop an award that on successful completion will allow candidates to progress to the HND Computer Aided Draughting and Design.

- 8 Provide an award that creates a route towards meeting the requirements for professional recognition.

3.3 Subject specific aims of the HNC award

- 9 Develop knowledge, understanding and skills in a range of core Computer Aided Draughting topics at HN level.
- 10 Develop knowledge, understanding and skills in a range of discipline related Computer Aided Draughting topics at HN level.
- 11 Develop a range of Communication and Information Technology knowledge skills relevant to CAD technicians/draughtsmen.
- 12 Allow a degree of specialisation within subject specific disciplines: Visualisation, Feature Based Modelling, Architectural CAD, Graphical Design, CAD Systems Management.

The new HNC CADD course will provide the candidate with the opportunity to develop a comprehensive level of knowledge and skills related to CADD. The core subjects 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.

Overall, a combination of the core principles and specialist options will present candidates with the prospect of developing a wealth of knowledge and skills in CADD related subjects. All candidates will have the chance to develop Communication and advanced IT knowledge and skills relevant to CAD related disciplines. The course will also provide a stepping-stone to further study i.e. HND CADD

3.4 Target groups

The HNC CADD course targets all candidates wishing to develop knowledge and skills in the use of Computer Aided Draughting and Design. The candidates enrolling on the HNC CADD course will come from a variety of backgrounds eg school leavers, industry users wishing to upgrade their skills, and adult returners wishing to retrain for work as CADD specialists.

Candidates at HNC level may already be in employment and will attend centres on a day-release or other part-time basis. The proposed HNC framework is flexible enough to allow centres to deliver the HNC award by various modes of delivery, for example, two-year day-release, evening attendance and distance learning etc.

Full-time HNC candidates may be school leavers who have not gained the required University entry qualifications and who are using the HNC CADD award as an alternative means of gaining access to a University education. Full-time candidates may also be more mature persons who are seeking a change of employment.

Candidates who successfully gain the HNC CADD award will improve their prospect of attaining University entrance and/or employment within CADD related industries.

3.5 Employment opportunities

Candidates who successfully gain the HNC CADD award will be primarily looking to become a CADD technician / Operator or Junior Designer in a variety of industries including, Architecture / Construction, Engineering (Mechanical, Electrical, Fabrication, Manufacturing), Furniture and Interior Design, Product Design, etc.

3.6 Articulation

Candidates successfully achieving the HNC CADD certificate will be able to progress to the HND Computer Aided Draughting and Design course year 2.

Although there are no formally agreed articulation routes into university for HNC CADD candidates, those completing the HNC CADD course and not wishing to continue onto the 2nd year of the HND programme may through negotiation gain entry into university. Entry to university will be at the discretion of the individual institution.

As a point of information, candidates completing the HNC then HND CADD courses at Motherwell College can articulate directly into 3rd year of the BSc Computer Aided Design course at The University of Paisley. Forth Valley College currently articulate HND CADD candidates into the 2nd year Architectural technology programme at Napier University.

4 Access to awards

In defining the access requirements to the HNC Computer Aided Draughting and Design award, the Design Team was anxious to ensure that no artificial barriers were created to prospective candidates. Access to the course will always be at the discretion of the delivering centre.

As a guide the following points are considered suitable access qualifications:

- ◆ possession of the Certificate in CAD (an SQA PDA award)
- ◆ possession of an NC in a related discipline eg Engineering, Architecture, Furniture design etc.
- ◆ possession of a suitable group of Standard grades which MUST include Graphical Communication (or equivalent)
- ◆ possession of a Higher in Graphical Communication (or equivalent)
- ◆ possession of a HNC in a related discipline eg Engineering, Architecture
- ◆ CAD qualifications from other awarding bodies
- ◆ possession of a degree in a suitable discipline

Consideration must also be given to industry candidates who may not possess any of the above entry qualifications. Such candidates should be considered on their own merit, which can be gauged at an informal interview with the centre's course leader/tutor or admissions person. Indeed it is strongly recommended that ALL applicants be interviewed.

The recommended Core Skills Entry profile for the HNC Computer Aided Draughting and Design is as follows :

- | | |
|--------------------------|----------------|
| ◆ Communication | Intermediate 2 |
| ◆ Information Technology | Intermediate 2 |
| ◆ Numeracy | Intermediate 2 |
| ◆ Problem Solving | Intermediate 2 |
| ◆ Working with Others | Intermediate 1 |

5 Award structure

The structure of the HNC CADD Award is split into Mandatory and Optional Units. The Mandatory Units give a total of 9 SQA credits and a further 3 credits must be gained from the Optional Units to successfully achieve the award.

5.1 Framework

The structure of the HNC Computer Aided Draughting and Design award is outlined below:

Mandatory Units (9 Credits)

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
Graded Unit	DW15 34	8	7	1

Optional Units (3 credits from the following required)

Unit Title	Code	SCQF Credit points	SCQF level	SQA Credit Value
CAD: Visualisation, Rendering and Presentation	DW18 34	8	7	1
CAD: Feature Based Modelling 1	DW19 34	8	7	1
CAD: Systems Management	DW1A 35	16	8	2
CAD: Graphical Design	DW1C 34	8	7	1
CAD: Architectural 1	DW1D 34	8	7	1
Design for Manufacture	DR3M 35	8	8	1
CAD: Skills	F8LW 34	16	7	2
Personal Development Planning	DE3R 34	8	7	1
Workplace Communication in English	H8T2 33*	8	6	1
Computer Aided Engineering (CAE) and Prototyping	DR1R 35	16	8	2

The purpose of the Graded Unit is to assess the candidates' ability to integrate and apply the knowledge and/or skills gained in individual Units contained within the mandatory section of the HNC CADD framework. The assessment for candidates sitting the HNC Graded Unit will be in the form of a project.

5.2 Core Skills Entry Level

The Core Skills Entry profile for the HNC Computer Aided Draughting and Design is as follows:

- ◆ Communication SCQF 5 (Intermediate 2)
- ◆ Information Technology SCQF 5 (Intermediate 2)
- ◆ Numeracy SCQF 5 (Intermediate 2)
- ◆ Problem Solving SCQF 5 (Intermediate 2)
- ◆ Working with Others SCQF 4 (Intermediate 1)

5.3 Core Skills Exit Level

The Core Skills recognised by SQA are at Levels Access 2 (SCQF level 2) to Higher (SCQF level 6) in:

- ◆ Communication
- ◆ Working with Others
- ◆ Problem Solving (certificated at level 6)
- ◆ Information Technology
- ◆ Numeracy

Research for the HNC award indicates that employers and Higher Education consider that while advanced skills in technology will be fundamental to achievement, the analytical thinking, evaluation and reviewing of complex problem solving are naturally occurring aspects of practical design activities. Similarly, sophisticated numerical and graphical competencies are a component of Computer Aided Draughting and Design. The framework of the award has been designed, therefore, to provide opportunities for developing and tailoring relevant elements of the Core Skills to the specific demands of the vocational area.

Identification by stakeholders of the need to ensure a professional level of ability to communicate orally and in writing with a range of others has led to the inclusion in the framework of a discrete Unit in Communication which allows contextualised opportunities for skills enhancement.

Candidates who achieve the HNC award will have opportunities to develop Core Skills to the following levels as a minimum

- | | |
|--------------------------|-----------------|
| ◆ Communication | SCQF 6 (Higher) |
| ◆ Problem Solving | SCQF 6 (Higher) |
| ◆ Working with Others | SCQF 6 (Higher) |
| ◆ Numeracy | SCQF 6 (Higher) |
| ◆ Information Technology | SCQF 6 (Higher) |

Core Skill elements are signposted in Appendix 4 for sample Unit Outcomes, although all Units offer opportunities for development of skills which are detailed in support notes. Awareness and development of core skills is further incorporated into the award by the requirement that candidates, supported by assessors, take responsibility for their individual learning, and communicate effectively, working co-operatively with a range of others.

The Graded Unit practical assignment integrates and applies knowledge and skills developed and encourages candidates to demonstrate and develop transferable key skills to a level which will facilitate progress to future destinations in education and industry.

5.4 Mapping information

The following grid identifies where the Unit specifications match the aims of the award:

Unit Title	Aims
Communication: Practical Skills	1; 2; 3; 4; 5; 6; 7; 8; 11
CAD: 2D I	1; 2; 3; 4; 5; 6; 7; 8; 9; 10; 11
CAD: 2D II	1; 2; 3; 4; 5; 6; 7; 8; 9; 10; 11
CAD: 3D Modelling	1; 2; 3; 4; 5; 6; 7; 8; 9; 10; 11
CAD: User Systems	1; 2; 3; 4; 5; 6; 7; 8; 9; 10; 11
CAD: Principles	1; 2; 3; 4; 5; 6; 7; 8; 9; 10; 11
Design Methodology	1; 2; 3; 4; 5; 6; 7; 10; 11
Graded Unit	1; 2; 3; 4; 5; 6; 7; 8; 9; 10; 11; 12
CAD: Visualisation, Rendering and Presentation	1; 2; 3; 4; 5; 6; 7; 8; 10; 11; 12
CAD: Feature Based Modelling 1	1; 2; 3; 4; 5; 6; 7; 8; 10; 11; 12
CAD: Systems Management	1; 2; 3; 4; 5; 6; 7; 8; 10; 11; 12
CAD: Graphical Design	1; 2; 3; 4; 5; 6; 7; 8; 10; 11; 12
CAD: Architectural 1	1; 2; 3; 4; 5; 6; 7; 8; 10; 11; 12
Design for Manufacture	1; 2; 3; 4; 5; 6; 7; 8; 10; 11
Computer Aided Engineering (CAE) and Prototyping	1; 2; 3; 4; 5; 6; 7; 8; 10; 11; 12

The new HNC CADD course will provide the candidate with the opportunity to develop a comprehensive level of knowledge and skills related to CADD. The core subjects 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.

Overall, a combination of the core principles and specialist options will present candidates with the prospect of developing a wealth of knowledge and skills in CADD related subjects. All candidates will have the chance to develop Communication and advanced IT knowledge and skills relevant to CAD related disciplines. The course will also provide a stepping-stone to further study ie HND CADD.

5.5 Mapping to National Occupational Standards

SEMTA is the Sector Skills Council for Science, Engineering and Manufacturing Technologies. As an employer-led body, SEMTA is governed by a Council whose members are made up of employer representatives from the major engineering sectors, the Trade Unions, Local Government, Educationalists and Group Training Associations. SEMTA has been licensed by the Secretary of State for Education and Skills to drive forward the effort to improve the UK's productivity through improvements in its sector's skills base.

A key goal of SEMTA is to improve learning supply, including apprenticeships, higher education and national occupational standards. The national occupational standards are designed to act as a benchmark of best practice.

There are eight SEMTA Units that are considered level 3 occupational standard covering eight functional areas of Computer Aided Draughting and Design. The table detailed in Appendix 5 presents a mapping of the eight standards against relevant Units and Outcomes from the SQA HNC Computer Aided Draughting and Design Group Award.

The SQA Unit CAD: Principles is the one SQA Unit that could be mapped against 7 out of the 8 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 HNC 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.

As there are no other known occupational standards for Computer Aided Draughting and Design this mapping exercise focuses on engineering disciplines using CAD technology.

It must be pointed out that delivering centres may choose not to deliver the course with an engineering bias. However, a large number of candidates completing the HNC CADD course could potentially work in an engineering environment and the occupational standards mapping is believed to have been a very worthwhile exercise.

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

5.6 Articulation, professional recognition and credit transfer

Several Units in the 'old' HNC CADD course may be suitable for credit transfer to the new Units in the 'new' HNC CADD course. A credit transfer grid is included in Appendix 6 and details information on credit transfer between the Units of the old HNC CADD course and the Units of the new HNC CADD course. The credit transfer grid is designed to make it as straightforward as possible for course tutors to assess the level of credit transfer from old to new Units.

6 Approaches to delivery and assessment

6.1 Content and Context

The HNC CADD has been designed to ensure candidates receive thorough practical knowledge of the concepts that have evolved in CAD software application packages. As such, the predominant content of the Units in the course is the practical application of the CAD system. This must not preclude the theoretical aspects of the topic being assessed and it is recommended that the theory and practical elements be integrated when a new topic is being introduced.

The course is structured to allow candidates to progress their CAD skills, from basic 2D draughting to the more advanced topics such as Customisation and Feature Based Modelling.

A Communication Unit has been included in the HNC CADD programme. All CAD users will require a high level of communication skills when working in industry, and communication is considered an essential element in all Higher National frameworks.

The design elements of the HNC programme should, where possible, aim to provide a broad range of problems requiring a design solution. The delivery of the design Units may focus on a particular industry eg architecture, but candidates must be given the opportunity to develop knowledge of other design problems in other industries e.g. engineering, product design, interior design etc. The candidates should understand the design process, and be able to identify that with minimum modification, the design process can be applied to help provide a solution to most design problems, no matter the industry. The design Units have been included to improve the candidate's employment prospects and future professional development opportunities.

6.2 Delivery

The new HNC Computer Aided Draughting and Design can be delivered on a full-time, block-release, part-time day or part-time evening basis. Staff responsible for timetabling at individual centres should take account of the progressive nature of the award and timetable Units in a logical and sequential order. An example of the succession of Units is given in Appendix 7 (Exemplar timetables). Underpinning research and planning tasks for the Graded Unit could begin after delivery of the Design Methodology Unit. The Course Team should be encouraged to take responsibility for the Graded Unit rather than individual assessors. Each member of the Course Team must be aware of the importance of each Mandatory Unit within the course in relation to the Graded Unit.

Lecturers may use a variety of teaching and learning approaches in delivering the Units in the HNC 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 wherever possible to provide 'real-life' situations and guest speakers are recommended to demonstrate particular topics within the course.

Lecturers should seek opportunities to allow candidates to develop their Core Skills within the Unit being delivered and such opportunities may include:

- ◆ allowing candidates opportunities to give full answers to questions
- ◆ correcting poor English in written responses
- ◆ allowing candidates to develop Communication skills in group work activities
- ◆ reinforcing Numeracy when delivering appropriate topics
- ◆ reinforcing Information Technology skills throughout the course
- ◆ developing problem solving skills by providing candidates with a range of increasingly difficult problems to solve
- ◆ developing team work and team leadership skills through group work

6.3 Assessment

There should be an appropriate assessment strategy in place for the HNC award and the following is recommended:

- ◆ consistent and efficient approaches are adopted to the development and administration of the Graded Unit with agreed national standards
- ◆ the assessment load on candidates and staff is sensible and that assessment does not detract from teaching and learning
- ◆ where possible a reliable moderation procedure is put in place to ensure consistent national standards are achieved
- ◆ it is recommended that all centres delivering the award refer to exemplar assessment material
- ◆ where possible, an holistic approach to assessment is recommended
- ◆ formative assessment could be used throughout the delivery of the Units to reinforce learning, build candidates' confidence and prepare candidates for summative assessment

- ◆ Assessment on demand

Assignments involving the integration of various Outcomes have been encouraged throughout the course. Cross Unit integration is also encouraged e.g. the 3D Modelling or Feature Based Modelling Units could be integrated with the Visualisation Unit, in that the models created in either of the modelling Units could be used for Outcome 1 of the Visualisation Unit. CAD:2D I focuses on learning 2D CAD skills eg how to create and edit geometry and could therefore be integrated with CAD: Principles which makes use of already owned 2D skills and focuses on ensuring a drawing is correctly laid out, dimensioned, annotated to a given standard, as used in industry.

The proposed HNC CADD programme offers a number of opportunities to take an integrated approach to the generation of evidence to match the assessment process of the individual Units. A portfolio-based approach could help facilitate such integration eg 2D assessments could be developed into 3D and visualisation etc.

The table below details a number of examples where integration of assessment may be achieved. Individual delivering centres are encouraged to integrate assessment where possible.

Any extra time saved by integration of assessments could be spent on reinforcing Core Skill elements.

Examples of integration opportunities	
1	CAD: Visualisation Outcome 1 can be integrated with CAD: Feature Based Modelling I Outcomes 2 and 3. The models created for the Feature Based Modelling assessments can be used for Outcome 1 of the Visualisation Unit.
2	CAD: Visualisation Outcome 1 can be partially integrated with CAD: 3D Modelling Outcomes 2 or 3. Additional models would need to be created to fully satisfy the requirements of Outcome 1 of the Visualisation Unit.
3	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, this contrasts to the CAD: Principles Unit which focuses on setting and working to standards.

6.4 Open and Distance Learning

The HNC CADD course has flexibility of delivery via open and distance learning methods and is considered a delivery method that favours the requirements of many potential candidates. Motherwell College, for example, has piloted/delivered the current HNC CADD course via distance delivery with some success. Centres must however consider arrangements with respect to the assessment of the Graded Unit.

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

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

Checking the validity of the work submitted (i.e. who produced the work) by a distance candidate can be difficult to confirm. It is suggested that the candidate could be spoken to over the telephone by the lecturer, and when asked key questions about the assessments, the candidate should be able to communicate/confirm how the work was achieved etc. Printed hardcopies of assessment material could be posted where necessary. Where the 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.

6.5 Assessment Exemplars

Assessment exemplars are available from SQA for all Units written specifically for the HNC CADD award.

6.6 Resource requirements

Centres choosing to offer/deliver the HNC CADD must pay particular attention to the computer hardware and software requirements of the course. The following list gives an overview of the software platforms required:

- ◆ 2D draughting software
- ◆ 3D and Solid Modelling software
- ◆ Feature Based Modelling software
- ◆ 3D Architectural Modelling software
- ◆ 3D Visualisation software
- ◆ Computer Graphics software (vector based)
- ◆ Word processing, Spreadsheet and Database software
- ◆ Access to the Internet (research purposes)

All of the software types listed above require high-end computer hardware specifications. This will be dependent on the software being run, advice should be sought from the various software vendors when purchasing the software.

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 HNC CADD award has been designed by a team of CAD specialists with input from both industry and higher education. The content of the qualification framework covers a considerable number of the most recent advances in CAD technology.

Within the award there is an opportunity to develop a comprehensive level of knowledge and practical skills in traditional CADD topics as well as the more advanced features that have been developed in modern CADD software packages. You will also develop knowledge and understanding of the design process and the stages of design where CADD can help in the achievement of a desirable design solution. The delivering centre should provide the opportunity for you to research CADD to gain an understanding of the industries in which CADD technology is being utilised e.g. Engineering design/manufacture, Architectural design, Product design, Furniture design, Interior design, Landscape design, Sign design, Jewellery design and Civil/Structural design, etc.

The design team has ensured that the assessments for the award meet national standards as well as reflecting industry practice. The assessment schedule for the award is optimised to allow adequate time for you to learn the essential knowledge and skills of Computer Aided Draughting and Design that are required for industry practice.

Assessment will be carried out at individual Unit and at award level. Individual assessment for Units will be in the form of practical and/or written tests. At the start of each Unit the assessing centre should inform you of the format for assessment. In addition the award is designed to assess your ability to integrate your knowledge and skills of the core material of Computer Aided Draughting and Design as a whole. You will achieve this by successfully completing the Graded Unit, which is assessed by project submission.

Centres should provide you with a brief summary of the Group Award before you commence your course of study. It should include information on what the award is about, provide information on the knowledge and skills to be developed, what is involved in assessment with particular reference to the Graded Unit and Core Skills and the conditions of the award. This would normally be presented in a course handbook and should also include information on the possible route(s) of progression in education and types of employment available for candidates obtaining the qualification.

Candidates intending to progress to the HND CADD year 2 should be guided towards the completion of 15 credits within the HNC study period.

As well as studying Computer Aided Draughting and Design subjects, you will also take Communication as part of the HNC. Good Communication skills are essential to the understanding of technical material and to communicating with others, whether on an individual basis or as part of a team. You will learn to develop such skills when doing the HNC. The combination of Units in the HNC CADD course will also help develop Core Skills to Higher (level 6) in the following areas:

- ◆ Communication
- ◆ Working with Others
- ◆ Problem Solving
- ◆ Information Technology
- ◆ Numeracy

Candidates who successfully gain the HNC CADD award will be primarily looking to become a CADD Technician/Operator or Junior Designer in a variety of industries including, Architecture/Construction, Engineering (Mechanical, Electrical, Fabrication, Manufacturing), Furniture and Interior Design, Product Design, etc.

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.

CADD: Computer Aided Draughting and Design

10 Appendices

Appendix 1	Industry questionnaire
Appendix 2	Labour Market Intelligence sourced from SEMTA
Appendix 3	Testimonials from former candidates
Appendix 4	Unit Grid — Core Skills
Appendix 5	SEMTA Mapping
Appendix 6	HNC CADD Unit credit transfer information
Appendix 7	Exemplar timetables

Industry Questionnaire
(with Responses)

11 RESPONDENTS

Scottish Qualifications Authority

Employers' Questionnaire on the new HNC Computer Aided Draughting & Design Award

Name of Company: -----

Contact Name: -----

e-mail address: ----- phone no: -----

Nature of Company's Business: -----

Shipbuilding & Design, Oil & Gas Service Co, Architect, Engineering Fabrications, Housebuilder, Diving Industry, Distilling, Manufacture Turned Components, Sub-Contract Engineering, Trussed Rafters, Structural Engineers

Company Size (number of persons employed at site): ----- Ranging from 7 to 4000

Please take a few minutes to study the attached draft HNC Framework and then answer the following questions:

Employment Opportunities

	<i>Yes</i>	<i>No</i>
<i>Q.1 Would your company consider employing someone with the new HNC in Computer Aided Draughting & Design?</i>	9	2
<i>Q.2 If you answered, Yes, to Q.1 in what capacity would your company employ such a person?</i>		

Draughtsperson, Design Role, General Draughting with a view to progression to Design Engineer, Architectural Technician, Design Draughtsman, Trainee Technician

Mandatory Section

The Units in the Mandatory section of the HNC are included to allow candidates to develop a knowledge and understanding of core computer aided draughting and design principles and technologies at Higher National level.

	<i>Yes</i>	<i>No</i>
<i>Q.3 Do you agree with the choice of Units in the Mandatory section of the HNC?</i>	8	3
<i>Q.4 If you answered, No, to Q.3 please indicate what changes you would like to see to the Mandatory section of the HNC.</i>		

Comment on changes to the Mandatory section of the HNC

Operating Systems for CAD Users – I would expect this to be a skillset of an HNC student.
Suggest stronger relationship with output drawings.
Design Methodology should be 2 credits.
Mandatory units with Outcomes in Mechanical/Electrical skills would have no real benefits to the construction industry.
Would like to see some form of Metallurgy and Selection/Strength of Materials.

Optional Section

This section of the award gives candidates the opportunity to choose the subject area best suited to their current employment needs and future career/educational developments. The candidate must choose 4 credits from the optional section.

	<i>Yes</i>	<i>No</i>
<i>Q.5 Do you agree with the choice of Units offered in this section?</i>	8	3

Q.6 If you answered No to Q. 5 comment on the changes you would like to see to the Optional Section of the HNC

Comment on the changes you would like to see to the Optional Section of the HNC

CAD Systems Management should be 1 credit.

Many of the optional units should be mandatory for those interested in construction.

Would prefer to see Feature Based Modelling moved to mandatory section.

Graded Unit

The new HNC in Computer Aided Draughting & Design includes a Graded Unit that is designed to assess the candidate's ability to integrate knowledge and understanding from across a range of the HNC Computer Aided Draughting & Design mandatory Units.

Candidates can achieve an A, B or C pass or Fail in the Graded Unit.

The HNC Development Team has taken the view that this Graded Unit should be a project. The alternative choice open to the Team is that the Graded Unit is an exam.

	<i>Yes</i>	<i>No</i>
<i>Q.7 Do you agree that the HNC Computer Aided Draughting & Design Graded Unit should be a project?</i>	10	1

Core Skills

HN award designers are encouraged to include opportunities to develop Core Skills, or even formally assess Core Skills, within new Higher National awards.

Q.8 Please tick the boxes of the Core Skills you would like candidates to have opportunities to develop or be formally assessed on within the HNC award.

	Developed	Assessed
Communication	8	3
Numeracy	6	5
Information Technology	4	7
Problem Solving	6	5
Working with Others	8	3

If you wish to make any additional comments with regard to this review please do so below

Would like to see a project and exam as part of the Graded Unit.
The qualification, as set out, looks very good and comprehensive.

Thank you for taking the time to complete this questionnaire.

Labour Market Intelligence sourced from SEMTA

The following information is extracted from the Sector Skills Council for Science, Engineering and Manufacturing Technologies (SEMTA) Labour Market Survey 2002.

The report detailed that 72% of electronics employers with skills gaps felt they had technical engineering skills gaps and this was particularly important for managers, professional engineers and technicians. Skills gaps for operators, sales/customer service staff and technicians would have the most significant impact on employers. The most important technical skills gaps were for general engineering skills, electrical/electronics skills, Computer Numerical Control (CNC) machine operations, assembly line/production robotics and Computer Aided Design (CAD). The main business impacts of these skill gaps were: increased operating costs; difficulties meeting customer service objectives; difficulties introducing new working practices and delays in developing new products or services.

Aerospace companies in Scotland (33%) were most affected by skills gaps. Skills gaps were mostly found at management, professional, craft and operator/assembler levels. Skills gaps for technical engineering skills (75%) were the most significant, particularly for general engineering skills, CNC machine operations, Computer Aided Design (CAD) and Computer Aided Manufacture (CAM).

The automotive sector also shows significant technical engineering skills gaps.

Overall employers with technical engineering skills gaps (75%) identify the most significant, particularly for general engineering skills, CNC machine operations, Computer Aided Design (CAD) and Computer Aided Manufacture (CAM).

The SEMTA employer survey of workforce development activity that covered the types of training bought by employers, showed that in the previous 12 months training had been provided in I-deas and Catia, Pro-E and AutoCAD, all CAD/CAM packages that are used particularly in aerospace and vehicle design and for passing design data to CNC machines in vehicle component manufacture.

Training organisations (44%) have demand for courses that they cannot provide. IT specialist courses feature strongly in this demand, including CAD, CAM, 3D modelling and CNC programming. The report identifies an insufficient supply of specialist IT provision including, CAD, CAM and 3D modelling.

Testimonials from former candidates

Motherwell College — HNC Testimonial

Former candidate

The Higher National Certificate course in Computer Aided Draughting and Design was originally an option for me at the time, to lead me into a career in teaching. However, once I started the course in CADD and began to find out more about the subject and the options it would give me in terms of culture, places of work and variety of industry options I decided to pursue an Industry based career.

I opted to further my education in CADD, progressing from HNC to HND and then onto 3rd year degree level. This choice was driven from my initial interest in the HNC CADD programme, which introduced exciting, interesting and advanced technologies of which I had little previous experience.

Since completing the HNC and latterly the degree I have worked as a CAD technician/designer in a variety of industries. I have managed to utilise many of the skills I learnt on the HNC course and have worked with both 2D and 3D systems while working in industry, this experience has taken me into a job that I can enjoy.

I have recognised that having had the experience of the progression from HNC to degree level has led me in a career path that I am very happy with. Having a record of the HNC CADD on my CV does impress and spark an interest in companies and employers as they are interested in the subject and want to know more.

Name: Former candidate
Job Title: CAD/CAM Designer (Furniture Industry)
Course Studied: HNC-D CADD
Study Duration: 2000–2002

During my study at Motherwell College I learned many different aspects of CAD, and related subjects, which are relevant to my position of employment now.

There is not a day at my work when I do not use AutoCAD (version 2005) so obviously the software education I received with this package, during the HNC course, has been invaluable. The 2D side of AutoCAD was covered to the point where I use many AutoCAD features to save drawing time, the use of templates, blocks or LISP for example are very common.

Due to the nature of my work it has been proven that the use of 3D is extremely beneficial, the course covered this in great detail for the creation of solid models and this is now a very simple process. The one thing I would like to have known more on is the rendering side of solid modelling. I do not find AutoCAD a simple tool to carry this task out, or, do I find the materials to be particularly great if this is all that you have to work with. I have learned to get other materials from other sources and to use dedicated rendering software such as Bryce. I believe this would be a welcome addition to the current course, if not already a feature.

Bryce is now produced by Corel and we used other Corel products for education on digital imaging in the course. Although I do not use Corel Photo-Paint anymore I do utilise the skills that I was taught with this package, on more or less a daily basis, in Adobe Photoshop.

DXF's are an integral part of my position and this format was taught in the HNC so I had no problems using it. A more updated look at CNC and CAM would have been beneficial to my position and possibly others. However this is very industry specific and I understand the HNC has to cover as many aspects of CAD as possible without concentrating on one chosen industry.

3D animation software is something that I would like to have been taught more on, I use this at home but not in work at present, although there has been talk of creating a CD-ROM for furniture construction through this medium.

There are various other things that I learned via the HNC course, including better communication skills, yet one of the most important things that people should learn, and I cannot stress this enough, is good file management. I have been in my position for more than 3 years and in that time I have created thousands and thousands of files. People were not too keen on this part of the course but knowledge of file management, Word and Excel are critical I believe.

HNC CAD

Former candidate

Since completing the HNC CAD I have seen my career advance in ways, and at a speed, which previously would have been unthinkable. This course has opened so many doors for me.

Combining this course with a full time job and young family was very tricky but with the help and support of my lecturer, motivation to complete the workload was never a problem.

The challenges set were varied and testing, but I managed to complete them and often left with ideas of how to implement elements of the coursework into my job.

I found this course highly rewarding and stimulating and as a result I am currently half way through my final year in the HND.

Motherwell College

Former candidate

My first experience of CAD was the drawings provided to me as a mobile phone mast erector. On a daily basis I was in contact with the design office and was using drawings that had been created using a CAD package. This involvement stimulated my interest in drawing and designing using computers, so I used the internet and discovered my local college provided courses. I started the HNC Computer Aided Draughting and Design course at Motherwell College in the autumn of 2004. In that first year I learned various skills from 2D and 3D draughting, solid modelling, customisation, graphics and operating systems, architectural CADD, feature based modelling and personal portfolio development. I used the highest spec of industry standard software such as AutoCAD, Corel, architectural desktop, AutoDesk inventor and the Microsoft suite. I enjoyed the HNC course and decided that it would make sense to carry on and further my skills in the HND course.

During the first month of my HND year at Motherwell College the Course Leader approached me with a possible job interview with a medium to large Timber Frame System Company looking for students with the appropriate skills and HNC CADD qualification. With the skills I had learned and the confidence gained in my ability during my time at Motherwell College, I managed to gain employment within the industry as a timber frame technician. I still attend Motherwell college as an evening student progressing towards my HND CADD qualification and to further my career.

HNC CADD

Former candidate

My first experience of CAD was when I was serving my apprenticeship as a Mechanical Fitter. I attended Motherwell College on day release studying for my NC/HNC in Multi Discipline Engineering, which had a block including CAD. I thought that the use of computers to design was interesting, and wanted to pursue a career using AutoCAD. In the autumn of 2002 I decided to return to college through evening classes to study for the HNC in CADD. During this course I accrued various skills including 2D & 3D Draughting, Solid Modelling, Graphics, Operating Systems and Customization by use of programming software such as Lisp, C++ and Visual Basic. To achieve these skills the college provided me with top industry standards software such as AutoCAD, Architectural AutoCAD, AutoDesk Inventor, Corel Draw, 3D Max, and use of the Microsoft Suite. On completion of the HNC in 2004 I decided to return to evening classes to study for the HND in which I am currently still studying for.

A year into the HNC course I applied for a job within the design office as a Mechanical Engineering draughtsman. I in turn was accepted for this job and was able to further my skills by using software such as AutoCAD and AutoDesk Inventor.

In 2004 the factory in which I worked closed down and I was offered a job with a Timber Frame House manufacturing company, which led to me having to use traditional methods of draughting — drawing board and pen. After 18 months with this company I was approached by another Timber Frame company, who were using Architectural AutoCAD as their primary draughting software, to manage their drawing office. The reason they approached me was due to the skills that I have achieved throughout my attendance of evening classes at Motherwell College. So far the courses have helped me to further my career and hopefully I can progress further with the use of the qualifications I have gained.

Dear Sir,

AutoCAD Course, Forth Valley College

During my employment in the Civil Engineering and Building services over the past thirty years, I have come across many innovations in these fields. In the course of this varied employment several key areas have seen advancement in massive leaps and bounds.

One of these areas is the general advancement of the P.C. in the workplace, coupled with this is the software used on these P.C's. One such software application with which I have seen a quantum leap is the growing and evolving use of AutoCAD as a tool in the Civils and Engineering armoury.

Until recently I was employed in the Civils sector based in the maintenance of a specific Local Authority area, with responsibility for all roads maintenance within this area and a budget in the region of approximately £750K annually. Since I became aware of the above course and was fortunate enough to be able to come on this course I have been able to apply for other posts within this organisation which has allowed me to advance and gain more experience as well as allowing me to raise my salary scale.

Without this course it would have been extremely difficult for me to gain the necessary experience to allow me to go forward in my career. Not only this but others within my organisation have asked for advice on such courses and are actively engaged in either doing this course or planning to do this course.

The change to my future has been considerable. At one point there was no sign of any further advancement for me until this course came along. This coupled with my historical education and draughtsmanship that I gained in High school and in the workplace I have managed to improve my skill base and advance my career.

Yours sincerely

HNC CADD EVALUATION

Dear Sir,

Please find enclosed my evaluation of the HNC CAD course, based at Forth Valley Campus Falkirk. Having followed this course for the last 2 years on a part –time basis, as I am in full employment as a lecturer in construction, this course has given me the opportunity to train and continue working.

I have found the course ideal, as it has allowed me to advance my skills under staff training provision and meet my department's future development plans. The course is very flexible and well set out with back up and support from lecturing staff. The department has continually updated and replaced software and equipment keeping up with current and industrial needs.

The staff is most helpful and easy to talk to and are always willing to discuss any problems, which may occur.

Yours sincerely

Unit Grid — Core Skills

The HNC 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 being integrated.

Unit Title	Communication			Numeracy		Information Technology	Problem Solving			Working with Others
	Read	Write	Oral	Using Number	Using Graphical Inform.	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							√*	√*	√*	

*certificated at level 6

Unit Title	Communication			Numeracy		Information Technology	Problem Solving			Working with Others
	Read	Write	Oral	Using Number	Using Graphical Inform.	Using Information Technology	CT	P & O	R & E	Working with Others
CAD: Visualisation, Rendering and Presentation			√							
CAD: An Introduction to Feature Based Modelling										
CAD Systems Management	√	√								
CAD: Graphical Design					√					
CAD: An Introduction to Architectural CAD				√	√					
Design for Manufacture			√							√

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)

SEMTA Occupational Standards Unit	Relevant SQA Units	Notes
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)
Unit No 26: Producing Engineering Drawings using Computer Aided Design	CAD: Principles CAD:2D I CAD:2D II Design Methodology CAD:3D Modelling CAD:Feature Based Modelling	All aspects of this SEMTA Unit No: 26 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)

HNC CADD Unit Credit Transfer Information

Old Unit Title	Credit Value	New Unit Title	Credit Value	Status (Full, Partial or No Credit Transfer)
Computer Aided Draughting (D4FW04)	1	CAD: 2D I (DW1E 34)	1	Full
CAD Systems Management (D2J504) & Solid Modelling (D2J304)		CAD: 2D II (DW12 34)	1	Partial (Does not include Outcome 3 of new Unit)
Computerised 3D Modelling (D4G304) & Solid Modelling (D2J304)	3 total	CAD: 3D Modelling (DW13 34)	2	Full
Communication: Presenting Complex Communication for Vocational Purposes (D5P304)	1	Communication: Practical Skills (D77G 34)	1	Full
Operating Systems for CAD users (D2J204)	1	CAD User Systems (DW14 34)	1	Full
Computer Aided Draughting (D4FW04) & Design Drawing and Communication for Engineers (D4GD04)	1	CAD Principles (DW16 34)	1	Full
	1	Design Methodology (DW17 34)	1	None
		Graded Unit (DW15 34)	1	None
Shading and Rendering (A71E04) or Rendering with Solids (D9V804)	1	CAD: Visualisation, Rendering and Presentation (DW18 34)	1	Partial (Does not include Outcome 3 of new Unit)

Old Unit Title	Credit Value	New Unit Title	Credit Value	Status (Full, Partial or No Credit Transfer)
Feature Based Modelling: An Introduction (D9V704)	1	CAD: Feature Based Modelling 1 (DW19 34)	1	Full
CAD Systems Management (D2J504)	2	CAD: Systems Management (DW1A 35)	2	Full
Computer Aided Graphical Design (D2JA04)	1	CAD: Graphical Design (DW1C 34)	1	Full
Architectural CAD: An Introduction (D9V904)	1	CAD: Architectural 1 (DW1D 34)	1	Full
Design for Manufacture	1	Design for Manufacture (DR3M 35)	1	Full
		Computer Aided Engineering (CAE) & Prototyping (DR1R 35)	2	None

Exemplar timetables

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

Full- time attendance completing 12 credits inclusive of 9 mandatory credits and 3 optional credits.

Block 1 (Completing 4 credits)	09.00-10.30	10:45-12.15	LUNCH	13:00-14:30	14:15-16.15
	1	2		3	4
	CAD: 2D I	CAD: 2D I		CAD: User Systems	CAD: User Systems
	Design Methodology	Design Methodology		CAD: Graphical Design	CAD: Graphical Design

Block 2 (Completing 4 credits)	09.00-10.30	10:45-12.15	LUNCH	13:00-14:30	14:15-16.15
	1	2		3	4
	CAD: 3D Modelling	CAD: 3D Modelling		CAD: Systems Management	CAD: Systems Management
	CAD: Systems Management	CAD: Systems Management		CAD: 3D Modelling	CAD: 3D Modelling

Block 3 (Completing 4 credits)	09.00-10.30	10:45-12.15	LUNCH	13:00-14:30	14:15-16.15
	1	2		3	4
	CAD: Principles	CAD: Principles		Communication	Communication
	CAD: Graded Unit	CAD: Graded Unit		CAD: Visualisation, Rendering and Presentation	CAD: Visualisation, Rendering and Presentation

Part-time attendance completing 12 credits inclusive of 9 mandatory credits and 3 optional credits.

Year 1

Block 1 (Completing 2 credits)	09.00-10.30	10:45-12.15	LUNCH	13:00-14:30	14:15-16.15
	1	2		3	4
	CAD: 2D I	CAD: 2D I		CAD: User Systems	CAD: User Systems

Block 2 (Completing 2 credits)	09.00-10.30	10:45-12.15	LUNCH	13:00-14:30	14:15-16.15
	1	2		3	4
	Design Methodology	Design Methodology		CAD: Graphical Design	CAD: Graphical Design

Block 3 (Completing 2 credits)	09.00-10.30	10:45-12.15	LUNCH	13:00-14:30	14:15-16.15
	1	2		3	4
	CAD: 3D Modelling	CAD: 3D Modelling		CAD: 3D Modelling	CAD: 3D Modelling

Year 2

<p>Block 1 (Completing 2 credits)</p>	09:00-10:30	10:45-12.15	LUNCH	13:00-14:30	14:15-16.15
	1	2		3	4
	CAD: Feature based Modelling 1	CAD: Feature based Modelling 1		CAD: Architectural 1	CAD: Architectural 1

<p>Block 2 (Completing 2 credits)</p>	09:00-10:30	10:45-12.15	LUNCH	13:00-14:30	14:15-16.15
	1	2		3	4
	CAD: Principles	CAD: Principles		Communication	Communication

<p>Block 3 (Completing 2 credits)</p>	09:00-10:30	10:45-12.15	LUNCH	13:00-14:30	14:15-16.15
	1	2		3	4
	CAD: Graded Unit	CAD: Graded Unit		CAD: Visualisation, Rendering and Presentation	CAD: Visualisation, Rendering and Presentation