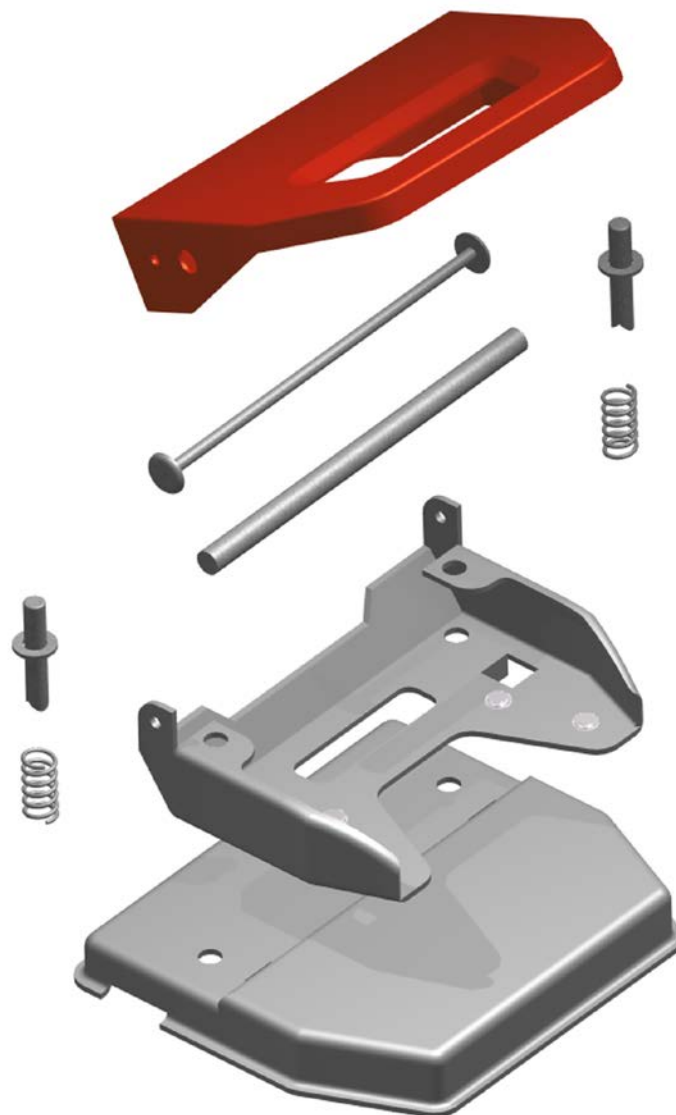# Level 2 Award and Certificate in Computer Aided Design and Manufacturing (7579-02)

Qualification handbook for centres

About City & Guilds
City & Guilds is the UK's leading provider of vocational qualifications, offering over 500 awards across a wide range of industries, and progressing from entry level to the highest levels of professional achievement. With over 8500 centres in 100 countries, City & Guilds is recognised by employers worldwide for providing qualifications that offer proof of the skills they need to get the job done.

City & Guilds Group
The City & Guilds Group includes City & Guilds, ILM (the Institute of Leadership & Management, which provides management qualifications, learning materials and membership services), City & Guilds NPTC (which offers land-based qualifications and membership services), City & Guilds HAB (the Hospitality Awarding Body), and City & Guilds Centre for Skills Development. City & Guilds also manages the Engineering Council Examinations on behalf of the Engineering Council.

Equal opportunities
City & Guilds fully supports the principle of equal opportunities and we are committed to satisfying this principle in all our activities and published material. A copy of our equal opportunities policy statement is available on the City & Guilds website.

Publications
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Level 2 Award and Certificate in Computer Aided Design and Manufacturing (7579-02)

Qualification handbook for centres

Qualification title	Number	Ofqual ref.
Level 2 Award in 2D Computer Aided Design	7579-02	500/7033/2
Level 2 Award in Computer Aided Manufacturing (2D)	7579-02	500/7033/2
Level 2 Certificate in Computer Aided Design and Manufacturing (2D)	7579-02	500/6703/5

Version and date	Change detail	Section
1.4 February 2014	Removed last registration/ certification dates (centres to refer to Walled Garden)	**About this document**

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1 About this document

This document contains the information that centres need to offer the following qualifications:

Qualification titles and levels	City & Guilds qualification numbers	Ofqual accreditation numbers	Last registration date	Last certification date
Level 2 Award in 2D Computer Aided Design	7579-02	500/7033/2	Please refer to the Walled Garden for last registration / certification dates	
Level 2 Award in Computer Aided Manufacturing	7579-02	500/7033/2		
Level 2 Certificate in Computer Aided Design and Manufacturing	7579-02	500/6703/5		

This document includes details and guidance on:
- centre requirements
- candidate entry requirements
- course design and delivery
- qualification standards and specifications
- assessment requirements

2 About the qualifications

2.1 Accreditation details

Accreditation details

These qualifications are

- accredited by the Qualifications and Curriculum Authority at Level 2 of the QCF

Qualifications and Credit Framework (QCF)

The QCF replaces the National Qualifications Framework (NQF) in England and Northern Ireland, and is intended to replace the regulated pillar within the Qualifications and Credit Framework for Wales (CQFW). It is also intended to align with the Scottish Credit and Qualifications Framework (SCQF). The QCF provides a way of recognising achievement through the award of credit for units and qualifications. Units within the framework are allocated a:

- level to indicate the level of difficulty
- credit value to indicate the size of the unit. 10 hours of **learning time** = 1 credit value.

Learning time is a notional measure of the amount of time a typical candidate might be expected to take to complete all the learning relevant to achievement of the learning outcomes. It differs from Guided Learning Hours (GLH) which represent only those hours a tutor/trainer or facilitator are present and contributing to the learning process because it takes into account all learning relevant to the learning outcomes regardless of where, when and how it has taken place.

The QCF recognises learning by awarding credit each time a candidate successfully completes a unit. Candidates can accumulate and transfer credit achievement over time.

A unit is the smallest part of learning for which credit is awarded. Candidates can also gain credit for full qualifications.

For further information about the QCF, CQFW and the SCQF, please refer to the websites for each country listed at Appendix 1.

2   About the qualification

2.2   Aims of the qualifications

2D Computer Aided Design - this qualification aims to equip candidates with the basic understanding and principles of 2D drawing environment, in terms of hardware, software and physical surroundings. It will explore the typical composition of a CAD system and health and safety matters that are associated with safe working practices.

Computer Aided Manufacturing – this qualification will allow candidates to demonstrate knowledge and use of a CAPP system to produce an NC file from imported CAD data, process & programming components, setting CNC machines and health and safety matters that are associated with safe working practices.

2   About the qualification

2.3 Rules of combination

Rules of combination are used to define the structure of qualifications. The rules of combination specify the credits which must be achieved through a particular combination of units to gain a full qualification.

The following tables outline the qualification number, size of the qualification, the credit value and accreditation unit reference.

Individual Practical Assessment Handbook's have been produced for the Award in 2D CAD and the Award in Computer Aided Manufacturing. These can be found on the City & Guilds website

2.4 Level 2 Award in 2D Computer Aided Design

To achieve the Level 2 Award in 2D CAD learners must achieve 7 credits from the mandatory units listed in the table below:

Accreditation unit reference	City & Guilds unit number	Unit title	Mandatory/ optional for full qualification	Credit value
D/600/3095	Unit 201	2D Computer Aided Design	Mandatory	7
n/a	Unit 206	2D CAD GOLA on-line test	Mandatory	n/a

2.5 Level 2 Award in Computer Aided Manufacturing (2D)

To achieve the Level 2 Award in Computer Aided Manufacturing learners must achieve 9 credits from the mandatory units listed in the table below:

Accreditation unit reference	City & Guilds unit number	Unit title	Mandatory/ optional for full qualification	Credit value
M/600/3103	Unit 202	(2D) Computer Aided Part Programming	Mandatory	4
D/600/3114	Unit 203	(2D) Manual Part Programming	Mandatory	2
M/600/3117	Unit 204	(2D) CNC Machining	Mandatory	2
T/600/3121	Unit 205	Re-instate the Work Area(s)	Mandatory	1

2.6 Level 2 Certificate in Computer Aided Design and Manufacturing (2D)

To achieve the Level 2 Certificate in Computer Aided Design and Manufacturing learners must achieve 16 credits from the mandatory units listed in the table below:

Accreditation unit reference	City & Guilds unit number	Unit title	Mandatory/ optional for full qualification	Credit value
D/600/3095	**Unit 201**	**2D Computer Aided Design**	**Mandatory**	**7**
M/600/3103	Unit 202	(2D) Computer Aided Part Programming	Mandatory	4
D/600/3114	Unit 203	(2D) Manual Part Programming	Mandatory	2
M/600/3117	Unit 204	(2D) CNC Machining	Mandatory	2
T/600/3121	Unit 205	Re-instate the Work Area(s)	Mandatory	1
n/a	Unit 206	2D CAD GOLA on-line test	Mandatory	n/a

2   About the qualification

2.7 Relevant sources of information

Related publications

City & Guilds also provides the following documents specifically for these qualifications:

Publication	Available from
Practical Assessment Handbooks	website
Centre Guides	website
Learner Guides	website
FAQ	website
Fast track approval form/generic fast track approval form	website

Other essential City & Guilds documents

There are other City & Guilds documents which contain general information on City & Guilds qualifications:

- ***Providing City & Guilds qualifications – a guide to centre and qualification approval***
  contains detailed information about the processes which must be followed and requirements which must be met for a centre to achieve 'approved centre' status, or to offer a particular qualification.

- ***Ensuring quality***
  contains updates on City & Guilds assessment and policy issues.

- ***Centre toolkit***
  contains additional information on *Providing City & Guilds qualifications*, in a CD-ROM, which links to the internet for access to the latest documents, reference materials and templates. The *Centre Toolkit* is sent to centres when they receive approved centre status. It is also available from to order at an additional cost.

- ***Online catalogue/shop***
  contains details of general regulations, registration and certification procedures and fees.

For the latest updates on our publications and details of how to obtain them and other City & Guilds resources, please refer to the City & Guilds website.

City & Guilds websites

Website	Address	Purpose and content
City & Guilds main website	**www.cityandguilds.com**	This is the main website for finding out about the City & Guilds group, accessing qualification information and publications.
SmartScreen	**www.smartscreen.co.uk**	SmartScreen is the City & Guilds online learning support website. It gives registered subscribers access to qualification-specific support materials.
Walled Garden	**www.walled-garden.com**	The Walled Garden is a qualification administration portal for approved centres, enabling them to register candidates and claim certification online.

Contacting City & Guilds by e-mail

The following e-mail addresses give direct access to our Customer Relations team.

e-mail	Query types
learnersupport@cityandguilds.com	all learner enquiries, including • requesting a replacement certificate • information about our qualification • finding a centre.
centresupport@cityandguilds.com	all centre enquiries
walledgarden@cityandguilds.com	all enquiries relating to the Walled Garden, including • setting up an account • resetting passwords.

3 Centre requirements
3.1 Obtaining centre and qualification approval

Only approved organisations can offer City & Guilds qualifications. Organisations approved by City & Guilds are referred to as **centres.**

Centres must meet a set of quality criteria including:
- provision of adequate resources, both physical and human
- clear management information systems
- effective assessment and quality assurance procedures including candidate support and reliable recording systems.

An organisation that has not previously offered City & Guilds qualifications must apply for approval to become a centre. This is known as the **centre approval process (CAP).** Centres also need approval to offer a specific qualification. This is known as the **qualification approval process (QAP)**. In order to offer these qualifications, organisations which are not already City & Guilds centres must apply for centre and qualification approval at the same time. Existing City & Guilds centres will only need to apply for qualification approval for these particular qualifications.

Full details of the procedures and forms for applying for centre and qualification approval are given

City and Guilds branch offices will support new centres through the approval process. They will appoint an External Verifier. They will also provide details of fees applicable for approvals. The local office will be the point of contact for all enquiries for these qualifications and will be responsible for monitoring the delivery and assessments through reports submitted by External Verifiers. They will be the first point of contact for any enquiries regarding the multiple choice examination.

Assessments must not be undertaken until qualification approval has been obtained and candidates have been registered.

City & Guilds reserves the right to withdraw qualification or centre approval for reasons of debt, malpractice or non-compliance with City & Guilds' policies, regulations, requirements, procedures and guidelines, or for any reason that may be detrimental to the maintenance of authentic, reliable and valid qualifications or that may prejudice the name of City & Guilds.

3   Centre requirements

3.2 Fast Track Approval

Centres approved to offer the Level 2 Certificate in 2D CAD (4353-01) may apply for approval in the new Level 2 Award in 2D Computer Aided Design (7579-02-201) using the **fast track approval form**, available from the City & Guilds website.

Centres may apply to offer the new qualifications using the fast track form

- providing there have been no changes to the way the qualifications are delivered, and
- if they meet all of the approval criteria specified in the fast track form guidance notes.

Fast track approval is available for 12 months from the launch of the qualification. After this time, the qualification is subject to the **standard** Qualification Approval Process. It is the centre's responsibility to check that fast track approval is still current at the time of application.

3.3 Global online assessment (GOLA)

The assessment for 2D CAD includes assignments and multiple-choice tests which covers the knowledge requirements for the Unit. The multiple choice test will be delivered on-line through the City & Guilds GOLA system with no paper-based alternative. Centres are required to register as a GOLA centre before any tests can be scheduled. The form for this is available from the website **www.city-and-guilds.co.uk/e-assessment**.

A centre only needs to register once for GOLA.

There is a GOLA helpline number - centre enquiries and technical enquiries about GOLA can be directed to this number **0845 241 0070**.

Centres can also e-mail: **gola@city-and-guilds.co.uk**

3 Centre requirements

3.4 Resource requirements

Physical resources

Centres must have an adequate learning environment. Resources should be accessible and reflect the nature of the qualification. They must also ensure that they have the staff and access to sufficient equipment so that candidates have the opportunity to cover all of the activities of the qualification.

Centre staff

Centre staff must satisfy the requirements for occupational expertise for these qualifications. Staff should be technically competent and experienced in the units for which they are delivering, teaching, training and assessing learning

3.5 Registration and Certification

Candidates must be registered at the beginning of their course. Centres should submit registrations using the Walled Garden, or Form S (Registration), under qualification and complex number -7579-02

When all assessment requirements have been successfully completed, internally and externally verified, candidate results should be submitted on the Walled Garden or Form S (Results). Centres should note that results will not be processed by City & Guilds where verification records are not complete.

Candidates achieving all of the required units will be issued with the full Level 2 Certificate. Candidates achieving one or more units within the Computer Aided Manufacturing qualifications will receive a Certificate of Unit Credit listing the unit(s) achieved. Certificates are not graded.

For information on the registration and certification periods for the qualification, centre should refer to the City & Guilds Directory of qualifications.

Full details of City & Guilds' administrative procedures for this qualification are provided in the *Directory of qualifications,* provided online to City & Guilds registered centres. This information includes details on:
- registration procedures
- enrolment numbers
- fees
- claiming certification.

These details are also available on the **www.cityandguilds.com**

3 Centre requirements
3.6 Quality Assurance

Internal quality assurance

Approved centres must have effective quality assurance systems to ensure optimum delivery and assessment of qualifications.

Quality assurance includes initial centre approval, qualification approval and the centre's own internal procedures for standardising and monitoring quality. Centres are responsible for internal quality assurance, ensuring that there are appropriate opportunities for open communication between the course team, scheme co-ordinator and external verifier. City & Guilds is responsible for external quality assurance.

Full details and guidance on the internal and external quality assurance requirements and procedures, are provided in *Providing City & Guilds Qualifications* and in the centre toolkit. This document also explains the tasks, activities and responsibilities of quality assurance staff.

All candidates' evidence must be available for external verification, Centres are also required to retain copies of candidates' assessment and internal verification records for three years after certification.

National standards and rigorous quality assurance are maintained by use of:
- City & Guilds assignment, marked by the centres according to externally set marking criteria
- Portfolio evidence assessed against set criteria
- Internal (centre) quality assurance
- City & Guilds external verification.

To meet the quality assurance criteria for this qualification, the centre must ensure that the following internal roles are undertaken:
- quality assurance co-ordinator
- primary assessor
- independent assessor
- internal verifier.

External quality assurance

External verifiers are appointed by City & Guilds to approve centres, and to monitor the assessment and internal quality assurance carried out by centres. External verification is carried out to ensure that assessment is valid and reliable, and that there is good assessment practice in centres.

To carry out their quality assurance role, external verifiers must have appropriate occupational and verifying knowledge and expertise. City & Guilds external verifiers attend training and development designed to keep them up-to-date, to facilitate standardisation between verifiers and to share good practice.

Further details of the role of external verifiers are given in *Providing City & Guilds qualifications*.

4 Course design and delivery

Recommended delivery strategies

Centre staff should familiarise themselves with the structure, content and assessment requirements of the qualifications before designing a course programme.

Provided that the requirements for the qualifications are met, centres may design course programmes of study in any way that they feel best meets the needs and capabilities of their candidates. Relationship tables are provided in Appendix 1 Relationships to other qualifications to assist centres with the design and delivery of the qualification.

Centres may wish to include topics as part of the course programme which will not be assessed through the qualifications for example to address local, organisational or government needs. Provided the aims, outcomes and knowledge requirements are met, centres have the flexibility to deliver the qualification in as many hours as they deem appropriate.

Data protection and confidentiality

Centres offering these qualifications may need to provide City & Guilds with personal data for staff and candidates. Centres will need to abide by the legal requirements of the country that they operate in. Centres and staff will be expected to maintain the confidentiality required by the laws and policies of national governments and the centres that offer the qualifications.

Health and safety

The requirement to follow safe working practices is an integral part of all City & Guilds qualifications and assessments, and it is the responsibility of centres to ensure that all relevant health and safety requirements are in place before candidates commence the programme.

Should a candidate fail to follow health and safety practice and procedures during an assessment, the assessment must be stopped. The candidate should be informed that they have not reached the standard required to successfully pass the assessment and told the reason why. Candidates may retake the assessment at a later date, at the discretion of the centre. In case of any doubt, guidance should be sought from the external verifier.

Initial assessment and induction

Centres will need to make an initial assessment of each candidate prior to the start of their programme. Candidates should have a reasonable level of English language and literacy skills.

The initial assessment should identify any specific training needs the candidate has, and the support and guidance they may require when working towards their qualification. The results of initial assessment will assist centres and tutors with the design and delivery of the courses to meet the particular needs of their candidates for both the class based and practical aspects of the course.

Centres should provide an induction programme to ensure the candidate fully understands the requirements of the qualifications they will work towards, their responsibilities as a candidate, and the responsibilities of the centre. It may be helpful to record the information as part of the learning contract/individual learning plan.

Equal opportunities

It is a requirement of centre approval that centres have an equal opportunities policy (see *Providing City & Guilds qualifications*). **Results and certification**

The regulatory authorities require City & Guilds to monitor centres to ensure that equal opportunity policies are being followed.

The City & Guilds equal opportunities policy is set out on the City & Guilds website, in *Providing City & Guilds qualifications*, in the *Directory of qualifications*, and is also available from the City & Guilds Customer Relations department.

Access to assessment

City & Guilds' guidance and regulations on access to assessment are designed to facilitate access for assessments and qualifications for candidates who are eligible for adjustments to assessment arrangements. Access arrangements are designed to allow attainment to be demonstrated. For further information, please see Access to assessment and qualifications, available on the City & Guilds website.

All candidates for City & Guilds qualifications receive a Notification of Candidates Results giving details of their performance.
Centres will also receive a consolidated results list detailing the performance of all candidates they enter, whether they are successful or not.

Further information about the issue of results and certification for centres is available online at www.cityandguilds.com or by contacting the City & Guilds Operations Support Service enquiries team

Appeals

Centres must have their own, auditable, appeals procedure that must be explained to candidates during their induction. Appeals must be fully documented by the quality assurance co-ordinator and made available to the external verifier or City & Guilds.

Further information on appeals is given in *Providing City & Guilds qualifications.* There is also information on appeals for centres and learners on the City & Guilds website or available from the Customer Relations department.

5 Units

5.1 About the units

Structure of units

The units in these qualifications are written in a standard format and comprise the following:

- City & Guilds reference number
- title
- level
- credit value
- unit aim
- relationship to NOS/other qualifications
- endorsement by a sector or other appropriate body
- statement of guided learning hours
- assessment and grading
- learning outcomes which are comprised of a number of practical and/or knowledge based assessment criteria
- guidance notes.

Summary of units

City & Guilds unit number	Title	QCF unit number	Credits
201	2D Computer Aided Design	D/600/3095	7
202	(2D) Computer Aided Part Programming	M/600/3103	4
203	(2D) Manual Part Programming	D/600/3114	2
204	(2D) CNC Machining	M/600/3117	2
205	Re-instate the Work Area(s)	T/600/3121	1
206	2D CAD GOLA on-line test	n/a	n/a

Unit 201   2D Computer Aided Design

Level: 2

Credit value: 7

Unit aim
This unit aims to equip candidates with the basic understanding and principles of 2D drawing environment, in terms of hardware, software and physical surroundings. It will explore the typical composition of a CAD system and health and safety matters that are associated with safe working practices.

Learning outcomes
There are **eight** learning outcomes to this unit. The learner will be able to:
1. Use associated IT, CAD hardware and operating systems
2. Use basic file management techniques and maintain health and safety requirements
3. Use and identify key components of the software relating to the 2D drawing environment
4. Use a range of viewing commands and set up the drawing space
5. Use drawing commands to produce shapes
6. Use the CAD software's co-ordinate system to aid accurate drawing
7. Use hatch, text and simple dimensioning routines
8. Use basic editing commands and produce simple hard copies

Guided learning hours
It is recommended that **60** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards
This unit is linked to the Performing Engineering Operations Level 2, unit 61 Producing CAD models (drawings) using a CAD system.

Endorsement of the unit by a sector or other appropriate body
This unit is endorsed by SEMTA.

Key Skills
This unit may help candidates to gain confidence in, and possibly generate portfolio evidence for, the following Key Skills:
*   Communication
*   Information and Communication Technology
*   Improving Own Learning and Performance
*   Problem Solving

Assessment and grading
This unit will be assessed by:
*   Two assignments covering practical skills - pass/fail.

- One GOLA on-line test covering underpinning knowledge – fail/pass/merit/distinction.

Unit 201   2D Computer Aided Design
Outcome 1   Use associated IT, CAD hardware and operating systems

Assessment Criteria
Practical Skills
The learner can:
1. select and use necessary hardware for a generic CAD station
2. select appropriate printer/plotter paper
3. recognise and report problems relating to components
4. select different parts of the desktop to initiate software
5. apply the following functions of the desktop window
    i)   maximise and minimise a window
    ii)   restore a window from the task bar
    iii)   manipulate the size of the active window
    iv)   evoke a number of windows on the desktop
    v)   move windows on the desktop
    vi)   switch between different programs
    vii)   drag and drop information from one window top another

Underpinning Knowledge
The learner can:
1. identify and describe the purpose of the main components of a CAD computer station
    i)   processor
    ii)   memory
    iii)   file storage
2. define the different types of common file storage available for a CAD station and explain the need for these methods
    i)   CD ROM
    ii)   hard drive
    iii)   USB
3. recognise the effects of hardware specifications on the efficiency of the CAD system specifically related to
    i)   processor type and speed
    ii)   RAM
    iii)   video processor card
4. describe input and output devices used within a CAD station
    i)   printer/plotter
    ii)   mouse
    iii)   keyboard
    iv)   VDU
    v)   modem
5. identify necessary consumables and media that are used in conjunction with hardware
    i)   printer/plotter paper
    ii)   ink/toner cartridges
6. identify the use of the internet in relation to the operation of a CAD station
    i)   downloading CAD files from a web site
    ii)   sending/receiving CAD files via e-mail
7. describe the effect of different screen resolutions on the VDU output
    i)   quality of graphics
    ii)   operational size of window
    iii)   display size
8. identify the terminology related to the operation of the desktop environment

       i)   icons

       ii)   task bar

       iii)   status bar

       iv)   menu options

9. identify the use of short cut keys

Unit 201 2D Computer Aided Design

Outcome 2   Use basic file management techniques and maintain health and safety requirements

Assessment Criteria
Practical Skills
The learner can:
1. apply a range of basic file operations: new, open, save, save as, close.
2. create new named directories/folders and move/copy files between directories.
3. delete and rename files and directories/folders
4. create back-up copies of files and directories/folders
5. display lists of files contained within a specific folder or directory, including details of file extensions

Underpinning Knowledge
The learner can:
1. describe briefly the directory/folder structure on a computer
2. identify ways of preventing the loss of data
3. describe what elements and practices create a good working environment
    i)   frequent breaks from the computer
    ii)   correct positioning of screens, chairs and keyboards
    iii)   lighting and ventilation requirements
4. state the health and safety precautions to adopt when using a computer
    i)   ensure power cables are safely secured
    ii)   ensure that power points are not overloaded
5. identify common injuries associated with the use of computers
    i)   repetitive strain injury (RSI)
    ii)   eye strain
    iii)   bad posture
6. identify current British or European legislation associated with the use of computers and health and safety
    i)   copyright
    ii)   data protection
    iii)   health & safety executive (HSE)

Unit 201   2D Computer Aided Design

Outcome 3   Use and identify key components of the software relating to the 2D drawing environment

Assessment Criteria
Practical Skills
The learner can:
1. display tool bars from the CAD system and remove unwanted toolbars from the user area.
2. move toolbars within the CAD environment to create usable work area
3. modify toolbars to add or remove existing icons/buttons
4. display, move and modify dialogue boxes from a CAD system
5. change the background colour and graphics cursor (cross hairs) size for the drawing window
6. change the command window size
7. change user Coordinate System (UCS) icon from on to off

Underpinning knowledge
The learner can:
1. identify the use of the different menu bar tools and toolbar sets within CAD and the purpose of scroll bars
    i)   draw
    ii)   modify
    iii)   properties
    iv)   standards
    v)   dimensioning
2. describe the use of dialogue boxes within the context of CAD
3. describe the purpose of the command window within CAD
4. describe the concept of the drawing area and how it relates to drawing units on a co-ordinate system based upon the theory of X and Y (Cartesian).

Unit 201 2D Computer Aided Design

Outcome 4 Use a range of viewing commands and set up the drawing space

Assessment Criteria

The learner can:
1. select and open an existing drawing from storage media
2. use a range of Zoom commands to look at specific parts of a drawing: real time, window, extents
3. set up a number of views of a drawing that can be easily restored
4. set up the drawing environment with the correct units in order to start producing a drawing
5. ensure that the limits of the designated screen area are appropriate for drawing to be produced
6. set up an appropriate grid and snap to aid drawing production
7. create and use a template which will set the drawing environment ready for drawing production.

Underpinning knowledge

The learner can:
1. describe the range of zoom techniques available within a 2D context
    i)   real time
    ii)   window
    iii)   extents
2. describe the benefits of setting up and using pre-defined views when producing a CAD drawing
3. illustrate the range of pan techniques available within a 2D context
    i)   scroll bars
    ii)   real time
4. describe the reasons for setting up the drawing environment and set up
5. describe the purpose of using grids and snap to aid drawing production
6. list the benefits of using templates

Unit 201   2D Computer Aided Design

Outcome 5   Use drawing commands to produce shapes

Assessment Criteria

Practical Skills

The learner can:

1. demonstrate the use of a line command to produce various shapes in the drawing window, with and without the use of grid, snap, orthographic and polar modes
2. produce entities that are connected to end points and defining points of existing drawing objects
3. produce a series of lines (multiple vertices) that are recognised by the software as one single line entry and with uniform or varying widths
4. draw a number of node points, using different point styles
5. use a range of commands to produce the following shapes.
    - i)   circles
    - ii)   rectangles
    - iii)   arcs
    - iv)   regular polygons
    - v)   ellipses

Underpinning knowledge

The learner can:

1. recognise the difference in properties between single line entries and lines with multiple vertices
2. identify the range of options available in order to place lines and shapes at specific points on an existing drawn object
    - i)   object snap options
3. describe the basic range of drawing commands available as detailed above

Unit 201   2D Computer Aided Design

Outcome 6   Use the CAD software's co-ordinate system to aid accurate drawing

Assessment Criteria

Practical Skills

The learner can:

1. demonstrate the use of grid and snap, together with the co-ordinate display to produce basic measured objects
2. demonstrate the of an absolute X,Y co-ordinate system to produce basic measured objects through keyboard entry
3. demonstrate the use of a relative X,Y co-ordinate system to produce basic measured objects through keyboard entry
4. demonstrate the use of a relative polar co-ordinate system to produce basic measured objects through keyboard entry
5. use a range of co-ordinate entry systems to produce varying levels of complex drawings
6. place different shapes, including circles, rectangles, nodes and regular polygons at known co-ordinate points and to specific sizes.

Underpinning knowledge

The learner can:

1. describe the principles of a simple co-ordinate system based upon X and Y axes
2. describe the principles of a simple co-ordinate system based on a polar system
3. identify the principles of all methods of co-ordinate entry aids available
    i)   snap
    ii)   grids
    iii)   direction entry

Unit 201   2D Computer Aided Design

Outcome 7   Use hatch, text and simple dimensioning routines

Assessment Criteria
Practical Skills

The learner can:
1. set up different styles of text for use on a drawing
2. perform a direct text entry method to create notes on a drawing
3. demonstrate the use of an alternative method of text entry to create notes on a drawing
4. justify text during input
5. perform basic dimension commands to dimension a drawing
6. fill an area with a variety of hatch patterns at different scales and angles.

Underpinning knowledge

The learner can:
1. describe the range if text entry methods available and the process involved in setting up a range of styles
   - i)   direct text
   - ii)   multi line text
2. identify the method of applying the text justification centre, fit and align
3. describe the process of filling closed objects with a variety of hatch patterns

Unit 201   2D Computer Aided Design

Outcome 8   Use basic editing commands and produce simple hard copies

Assessment Criteria

The learner can:

1. use a range of commands to alter entities that have been previously drawn, including the following procedures
    i)   erase
    ii)   chamfering
    iii)   filleting
    iv)   mirror
    v)   rotate
    vi)   trimming lines
    vii)   extending lines
    viii) breaking lines
    ix)   offset/parallel
    x)   lengthening/shortening lines
    xi)   explode/join lines
2. use a range of commands to move, scale, copy and array existing objects within the drawing
3. perform commands to produce a hard copy that fits an A4 sheet.

Underpinning knowledge

The learner can:
1. describe the process involved when modifying a drawing
2. describe the benefits of using modifying techniques within a CAD drawing
3. describe the process involved in producing a hard copy of a drawing

Unit 202 (2D) Computer Aided Part Programming

Level: 2

Credit value: 4

Unit aim
Use a CAPP system to produce an NC file from imported CAD data.

Learning outcomes
There are **eight** learning outcomes to this unit. The learner will be able to:
1. set up a workstation and associated hardware
2. import a 2D model into turning software
3. produce a complete production plan for the component manufacture
4. machine turned features (on screen)
5. post process the machining information for turning
6. import the component into the milling software
7. machine milled features (on screen)
8. post process the machining information for milling

Guided learning hours
It is recommended that **40** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards
This unit is linked to the Mechanical Manufacturing Engineering suite 2, unit 19 Operating CNC Turning Machines and unit 20 Operating CNC Milling Machines.

Endorsement of the unit by a sector or other appropriate body
This unit is endorsed by SEMTA.

Key Skills
This unit may help candidates to gain confidence in, and possibly generate portfolio evidence for, the following Key Skills:
- communication
- information and Communication Technology
- improving Own Learning and Performance
- problem Solving

Assessment and grading
This unit will be assessed by:
- one practical assignment – pass/fail.
- one centre set knowledge test – pass/fail.

Unit 202   2D Computer Aided Part Programming
Outcome 1   Set up a workstation and associated hardware

Assessment Criteria
Practical Skills
The learner can:
1. correctly open CAPP software
2. set up folders for storage of files
3. check input/output devices
4. use desktop functions to maximise efficiency
5. apply draw properties and attributes
6. initiate relevant icons and menu options needed

Underpinning Knowledge
The learner can:
1. state the minimum hardware requirements to run the software
    - i)   hard disc space required
    - ii)   RAM
    - iii)   video/graphics card size
    - iv)   operating system
    - v)   Processor speed
2. evaluate methods of files storage and transfer
    - i)   hard drive
    - ii)   network server
    - iii)   external hard drive
    - iv)   USB memory stick
    - v)   SD (secure digital) cards
3. identify and describe the uses of input and output devices
    - i)   VDU
    - ii)   keyboard
    - iii)   mouse
    - iv)   digitiser/tablets
    - v)   printer/plotter
    - vi)   scanners
4. recognise and use standard desktop functions
    - i)   change window size
    - ii)   copy/paste information
5. apply draw properties and attributes of the system
    - i)   draw properties
    - ii)   attributes
6. apply icons and menu options needed
    - i)   icons
    - ii)   menu options

Unit 202 (2D) Computer Aided Part Programming

Outcome 2 Import 2D model into turning software

Assessment Criteria

Practical Skills

The learner can:

1. initiate data transfer to import model
2. manipulate component to correct orientation
3. set datum required
4. create simple billet around part

Underpinning knowledge

The learner can:

1. list the types of data transfer for files available
    i) DXF
    ii) IGES
    iii) PRT
    iv) or any other commonly used.
2. describe the manipulation commands available
    i) rotation command
    ii) translate command
3. explain reason for choice of datum
    i) correct presentation of features to machine
    ii) ease of set-up on CNC machine
4. describe types of simple billets
    iii) solid billets
    iv) billets from part (castings-forgings).

Unit 202 (2D) Computer Aided Part Programming

Outcome 3 Produce a production plan to manufacture the component

Assessment Criteria
Practical Skills
The learner can:
1. select appropriate machine(s) and machining order
2. develop work holding methods
3. produce operation sequence sheet
4. produce tooling sheets

Underpinning knowledge
The learner can:
1. list the type of machine and machining order for the component
    i) size
    ii) amount of memory
    iii) operating system
    iv) spindle speeds
    v) rapid/feed rates
    vi) minimum number of setups
2. select appropriate work holding
    i) 3/4/jaw chuck
    ii) faceplate
    iii) direct to table
    iv) rotary chuck
    v) vice
    vi) fixture
    vii) between centres
3. identify instructions to produce component to specification
    i) material
    ii) sequence of profiles/features to be machined
    iii) clamping/work holding method
    iv) part number
    v) programmers name
    vi) speed/feed for each operation
    vii) positional data
4. list tooling information for production of component
    i) tool manufactures sheets/books
    ii) tool material
    iii) type of tool
    iv) material to be cut
    v) tool number

Unit 202   (2D) Computer Aided Part Programming

Outcome 4   Machine turned features (on screen)

Assessment Criteria
Practical Skills

The learner can:
1. identify features to be machined
2. select machining cycles
3. input basic machining parameters

Underpinning Knowledge

The learner can:
1. identify turning features
    - i) faces
    - ii) diameters
    - iii) tapers
    - iv) chamfers
    - v) fillets
    - vi) grooves
2. describe the different machining techniques
    - i) rough facing cycles
    - ii) rough turning cycles
    - iii) finish turn and face cycles
    - iv) parting and grooving cycles
3. describe basic machining parameters
    - i) cycle start/finish positions
    - ii) feeds/speeds
    - iii) finish allowance
    - iv) depth of cut
    - v) roughing trim cuts
    - vi) tool retract information
    - vii) tool/tip information
    - viii) others as required

Unit 202   (2D) Computer Aided Part Programming

Outcome 5   Post process machining information for turning

Assessment Criteria
Practical Skills

The learner can:

1. run machining simulation
2. check for machining errors
3. edit machining as required
4. post process machining information and store

Underpinning knowledge

The learner can:

1. describe common simulation features
    - i)   visual representation of cutter path
    - ii)   different views available
    - iii)   different tool colours
2. recognise 2D machining errors
    - i)   gouging
    - ii)   undercutting
    - iii)   tool fouling
    - iv)   collisions
3. describe reasons for editing
    - i)   improve machining time
    - ii)   error avoidance
4. describe storage and transfer methods for NC data
    - i)   hard disc
    - ii)   USB
    - iii)   network server
    - iv)   external hard drive

Unit 202 (2D) Computer Aided Part Programming

Outcome 6   Import the component into the milling software

Assessment Criteria
Practical Skills
The learner can:
1. initiate data transfer to import model
2. manipulate component to correct orientation
3. set datum required
4. create simple billet around part

Underpinning knowledge
The learner can:
1. list the types of data transfer for files available
    i)   DXF
    ii)   IGES
    iii)   PRT
    iv)   Or any other commonly used.
2. describe the manipulation commands available
    i)   rotation command
    ii)   translate command
3. explain reason for choice of datum
    i)   correct presentation of features to machine
    ii)   ease of setup on CNC machine
4. describe types of simple billets
    i)   solid billets
    ii)   billets from part (castings-forgings)

Unit 202 (2D) Computer Aided Part Programming

Outcome 7 Machine milled features (on screen)

Assessment Criteria
Practical Skills

The learner can:
1. identify features to be machined
2. select machining cycles
3. input basic machining parameters

Underpinning knowledge

The learner can:
1. describe features for milling operations
    - i) imported entities
    - ii) profiles
    - iii) pockets
    - iv) holes/bores
    - v) islands
    - vi) steps
2. describe the basic machining cycles
    - i) pocket cycles
    - ii) profile cycles
    - iii) drill/bore cycles
    - iv) roughing cycles
    - v) finishing cycles
3. list basic machining parameters
    - i) cycle start/finish positions
    - ii) tool entry/exit conditions
    - iii) tool information
    - iv) feed/speed information
    - v) step over values
    - vi) finish allowance
    - vii) depth of cut
    - viii) direction of cut
    - ix) tool offsets/compensation
    - x) others as system requires

Unit 202 (2D) Computer Aided Part Programming

Outcome 8 Post process machining information for milling

Assessment Criteria
Practical Skills
The learner can:
1. run machining simulation
2. check for machining errors
3. edit machining as required
4. post process machining information and store.

Underpinning knowledge
The learner can:
1. describe common simulation features
    i)   visual representation of cutter path
    ii)   different views available
    iii)   different tool colours
2. recognise 2D machining errors
    i)   gouging
    ii)   undercutting
    iii)   tool fouling
    iv)   collisions
3. describe reasons for editing
    i)   improve machine time
    ii)   error avoidance
4. describe storage and transfer methods for NC data
    i)   hard disc
    ii)   USB
    iii)   network server
    iv)   external hard drive

Unit 203   (2D) Manual Part Programming

Level: 2

Credit value: 2

Unit aim
The unit aims to equip learners with an understanding of the procedures for setting a CNC machine.

Learning outcomes
There are **four** learning outcomes to this unit. The learner will be able to:
1. Program languages
2. write a CNC program for a turned component
3. write a CNC program for a milled component
4. program prove and edit.

Guided learning hours
It is recommended that **20** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards
This unit is linked to the Technical Support Level 2, unit 15 Assisting in Producing or Modifying Operating Programs for CNC Machines.

Endorsement of the unit by a sector or other appropriate body
This unit is endorsed by SEMTA.

Key Skills
This unit may help candidates to gain confidence in, and possibly generate portfolio evidence for, the following Key Skills:
*   communication
*   information and Communication Technology
*   improving Own Learning and Performance
*   problem Solving

Assessment and grading
This unit will be assessed by:
*   one practical assignment – pass/fail.
*   one centre set knowledge test – pass/fail.

Unit 203   (2D) Manual Part Programming
Outcome 1   Program languages

Assessment Criteria
Practical Skills
The learner can:
1. use different programming languages

Underpinning Knowledge
The learner can:
1. explain the terminology used for programming
   - i)   ISO letter address
     - a) G codes
     - b) M codes
     - c) Tool data
     - d) Feed data
     - e) Speed data
   - ii)   conversational language
     - a) Linear commands
     - b) Circle commands
     - c) Circle centres
     - d) Feed data
     - e) Speed data
     - f) Tool data

Unit 203 (2D) Manual Part Programming

Outcome 2 Write a CNC program for a turned component

Assessment Criteria
Practical Skills
The learner can:
1. plan machining sequence
2. identify tools to be used
3. produce co-ordinate chart for tool positions
4. write program to face component using freehand moves
5. write a program to rough turn diameters using appropriate cycle
6. write a program to finish turn diameters using appropriate cycle using nose radius compensation
7. type up and test complete program

Underpinning Knowledge
The learner can:
1. Describe details required on a simple operation sequence sheet
   - i) machine type
   - ii) control type
   - iii) description of operation
   - iv) order of operations
   - v) operator instructions
2. Describe details required on a simple tooling sheet
   - i) tool number
   - ii) tool description
   - iii) spindle speed
   - iv) feed rate
3. Describe with the aid of diagrams the co-ordinate system used for CNC machine tools
   - i) Datum symbols
   - ii) X axis (+/-)
   - iii) Y axis (+/-)
   - iv) Z axis (+/-)
4. List the codes required for simple freehand programming
   - i) tool change
   - ii) spindle start
   - iii) spindle stop
   - iv) rapid reverse
   - v) cutting feed rate
   - vi) coolant commands
5. Describe the actions of simple turning cycles available to aid programming
   - i) rough turn
   - ii) finish turn
   - iii) rough and finish turn
   - iv) others as appropriate
6. Describe common tuning cycle parameters
   - i) cycle start position
   - ii) cycle end position
   - iii) depth of cut
   - iv) finish allowance
   - v) surface speed
   - vi) feed rate
   - vii) finish cut feed rate

viii)   others as appropriate
7. Describe the rules for the correct application of tool nose radius compensation
    i)   Codes required
        a)   compensation on (cutter left)
        b)   compensation on (cutter right)
        c)   compensation off
    ii)   start and finish positions to apply compensation
    iii)   moves required for applying compensation
    iv)   moves required for removing compensation
8. Describe methods of testing syntax of program
    i)   simulation
    ii)   dry run

Unit 203 (2D) Manual Part Programming
Outcome 3 Write a CNC program for a milled component

Assessment Criteria
Practical Skills
The learner can:
1. plan machining sequence
2. identify tools to be used
3. produce co-ordinate chart for tool position
4. write program to machine slots using freehand moves
5. write program to drill holes using appropriate drilling cycle
6. write program to machine profile using cutter diameter compensation
7. type up and test complete program

Underpinning Knowledge
The learner can:
1. Describe details required on a simple operation sequence sheet
    i) machine Type
    ii) control type
    iii) description of operation
    iv) order of operations
    v) operator instructions
2. Describe details required on a simple tooling sheet
    i) tool number
    ii) tool description
    iii) spindle speed
    iv) feed rate
3. Describe with the aid of diagrams the co-ordinate system used for CNC machine tools
    i) Datum symbols
    ii) X axis (+/-)
    iii) Y axis (+/-)
    iv) Z axis (+/-)
4. List the codes required for simple freehand programming
    i) tool change
    ii) spindle start
    iii) spindle stop
    iv) rapid traverse
    v) cutting federate
    vi) coolant commands
5. Describe the actions of simple drilling cycles available to aid programming
    i) drill
    ii) spot drill
    iii) peck drill
6. Describe the rules for the correct application of cutter diameter compensation
    i) Codes required
        a) compensation on (cutter left)
        b) compensation off (cutter right)
        c) compensation off
    ii) start and finish positions to apply compensation
    iii) moves required to apply compensation
    iv) moves required to remove compensation
7. Describe methods for testing syntax of program
    i) Simulation

ii)   dry run

Unit 203   (2D) Manual Part Programming

Outcome 4   Program prove and edit

Assessment Criteria
Practical Skills
The learner can:
1. prove programs
2. edit programs

Underpinning Knowledge
The learner can:
1. explain the different methods of program proving
    i)   dry run
    ii)   visual simulation
    iii)   use of optional stop
    iv)   speed and feed overrides
    v)   single block
2. explain editing procedures
    i)   block search
    ii)   command search
    iii)   block editing

Unit 204 (2D) CNC Machining

Level: 2

Credit value: 2

Unit aim
The unit aims to equip learners with an understanding of the procedures for setting a CNC machine.

Learning outcomes
There are **three** learning outcomes to this unit. The learner will be able to:
1. prepare and set up CNC machines
2. load program, prove and produce component in a safe manner
3. unload, clean and inspect component.

Guided learning hours
It is recommended that **20** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards
This unit is linked to the MME suite 2, unit 19 Operating CNC Turning Machines and UNIT 20 Operating CNC Milling Machines.

Endorsement of the unit by a sector or other appropriate body (if required, otherwise omit)
This unit is endorsed by SEMTA.

Key Skills
This unit may help candidates to gain confidence in, and possibly generate portfolio evidence for, the following Key Skills:
- Communication
- Information and Communication Technology
- Improving Own Learning and Performance
- Problem Solving

Assessment and grading
This unit will be assessed by:
- one practical assignment - pass/fail.
- one centre set knowledge test – pass/fail.

Unit 204   (2D) CNC Machining

Outcome 1   Prepare and set up CNC machines

Assessment Criteria
Practical Skills
The learner can:
1. load work holding devices
2. load work pieces
3. set datum's
4. load tools
5. set offsets

Underpinning Knowledge
The learner can:
1. recognise the different work holding devices
   - iii)   Fixtures
   - iv)   Chucks
   - v)   Colletts
   - vi)   Vices
   - vii)   Centres
   - viii)   Grid plate
   - ix)   Pallets
2. describe methods of setting datum's
   - i)   Probe
   - ii)   Bar and slip
   - iii)   Wobbler
   - iv)   Feeler gauges
   - v)   Cutter/cutting tool
3. explain types of tools and reasons for choice
   - I)   Slot drills
   - II)   End mills
   - III)   Centre/spot drills
   - IV)   Drills
   - V)   Single point turning tools
4. explain ways of setting tool and diameter offsets
   - i)   Feeler gauges
   - ii)   Light sensor
   - iii)   Preset gauge
   - iv)   Bar and slip
   - v)   Probe
5. describe different tool changers
   - i)   Turrets
   - ii)   manual tool crib
   - iii)   auto tool changers
     - a)   Tool turrets
     - b)   Chain type
     - c)   Drum
     - d)   Carousel
     - e)   Egg box

Unit 204 (2D) CNC Machining

Outcome 2 Load program, prove and produce component in a safe manner

Assessment Criteria
Practical Skills
The learner can:
1. store and transfer files
2. prove program
3. use machine codes
4. select and load tooling
5. run machine to produce component to specification

Underpinning Knowledge
The learner can:
1. describe methods of file storage and transfer
    i) database
    ii) hard drive
    iii) external hard drive
    iv) USB
    v) CD
    vi) DNC
2. explain methods of proving programs
    i) simulation
    ii) dry run
    iii) single block
    iv) machine/axis lock
3. describe machine instruction codes
    i) programme stop
    ii) optional stop
    iii) linear codes
    iv) feed codes
    v) speed codes

4. describe the safety procedures during proving and manufacture
    i) emergency stop
    ii) rapid override
    iii) feed override
    iv) speed override

Unit 204　　　(2D) CNC Machining
Outcome 3　　　Unload, clean and inspect component

Assessment Criteria
Practical Skills
The learner can:
1. safely unload component from machine
2. clean and de-burring of component
3. check/inspect component
4. make alterations to meet specification?

Underpinning Knowledge
The learner can:
1. observe safety considerations when unloading
    i)　　　position of component relative to tooling
    ii)　　　tooling hazards
    iii)　　　coolant hazards
    iv)　　　handling of sharp components
2. identify safety hazards associated with machined components
    i)　　　handling of sharp components
    ii)　　　residue of coolant
    iii)　　　hazards from compressed air
3. evaluate inspection methods
    i)　　　in process measurement
    ii)　　　inspection equipment (gauges)
    iii)　　　measuring instruments (callipers, micrometers)
    iv)　　　optical projectors
    v)　　　co-ordinate measuring machines (CMM)
4. list possible machine parameters requiring alteration to meet specification
    i)　　　tool/cutter length offsets
    ii)　　　tool/cutter diameter offsets
    iii)　　　feedrate overrides
    iv)　　　speed overrides

Unit 205 Re-Instate the Work Area

Level: 2

Credit value: 1

Unit aim
To restore the work area(s)

Learning outcomes
There is **one** learning outcome to this unit. The learner will be able to:
1. Re-instate the work area(s)

Guided learning hours
It is recommended that **10** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Endorsement of the unit by a sector or other appropriate body
This unit is endorsed by SEMTA.

Key Skills
This unit may help candidates to gain confidence in, and possibly generate portfolio evidence for, the following Key Skills:
- Communication
- Information and Communication Technology
- Improving Own Learning and Performance
- Problem Solving

Assessment and grading
This unit will be assessed by:
- One centre set knowledge test – graded pass/fail.

Unit 205 Re-Instate the Work Area

Outcome 1 Re-instate the work area

Assessment Criteria

Practical Skills

The learner can:
1. comply with relevant Health and Safety Legislation
2. restore work area(s)
3. safely dispose of waste

Underpinning Knowledge

The learner can:
1. identify and comply with relevant Health and Safety Legislation
   - i)   Health and Safety at Work Act 1974
   - ii)   Display Screen Equipment (DSE) Act 1992
   - iii)   Management of Health & Safety at Work Regulations 1999
   - iv)   Workplace Health & Safety & Welfare 1992
   - v)   COSHH 2002
   - vi)   Provision and Use of Work Equipment Regulations 1998
   - vii)   Manual Handling Operations 1992
   - viii) Waste Regulations
2. explain requirements for restoring work area
   - i)   good housekeeping
     - a) lighting
     - b) seating
     - c) isolation of equipment
     - d) cleaning of machines and equipment
     - e) storage and inspection of tooling
     - f) storage and inspection of equipment used
     - g) disposal of waste
3. identify disposal methods for waste/hazardous material
   - vi)   segragation
   - vii)   labelling
   - viii) disposal methods
4. describe remedial actions required to solve waste problems in terms of
   - VI)   spillages
   - VII)   losses
     - a) coolant
     - b) oils
     - c) financial
   - VIII) Damage
     - a) containers
     - b) storage
     - c) facilities
     - d) environment

6   Assessment

6.1   Assignments

Full assignment details can be found in the Practical Assessment Handbooks which are located on the 7579 webpage. These are listed as:

- 7579-02 Level 2 2D CAD Practical Assessment Handbook
- 7579-02 Level 2 CAM (2D) Practical Assessment Handbook

6.2   Test Specifications

The test specification for the GOLA unit (206) is below:

7579-02-206 2D CAD GOLA Test
Duration: 40 minutes

Unit number	Outcome	No. of questions	%
206	1 - Use associated IT and CAD hardware and operating system	4	16
	2 - Use basic file management techniques and maintain health and safety requirements	3	12
	3 - Use and identify key components of the software relating to the 2D drawing environment	3	12
	4 - Use a range of viewing commands and set up the drawing space	4	16
	5 - Use drawing commands to produce shapes	3	12
	6 - Use the CAD software's co-ordinate system to aid accurate drawing	2	8
	7 - Use hatch, text and simple dimensioning routines	3	12
	8 - Use basic editing commands and produce simple hard copies	3	12
	Total	25	**100**

Graded fail, pass, merit or distinction.

Appendix 1   Relationships to other qualifications

Links to other qualifications and frameworks

City & Guilds has identified the connections to previous qualifications. This mapping is provided as guidance and suggests areas of overlap and commonality between the qualifications. It does not imply that candidates completing units in one qualification are automatically covering all of the content of the qualifications listed in the mapping.

Centres are responsible for checking the different requirements of all qualifications they are delivering and ensuring that candidates meet requirements of all units/qualifications. For example, units within a QCF qualification may be similar in content to units in the NQF qualification which the candidate may have already undertaken and this may present opportunities for APL.

This qualification has connections to the following:

NQF units		QCF units	
Unit Number/Title		**Unit Number/Title**	
H/102/4706	Level 2 Certificate in 2D Computer Aided Design	D/600/3095	Level 2 Award in 2D Computer Aided Design

Key/Essential Skills (England, Wales and Northern Ireland)

Key Skills signposting
This qualification includes opportunities to develop and practise many of the underlying skills and techniques described in Part A of the standard for each Key Skills qualification. Where candidates are working towards any Key Skills alongside this qualification they will need to be registered with City & Guilds for the Key Skills qualifications.

It should not be assumed that candidates will necessarily be competent in, or able to produce evidence for, Key Skills at the same level as this qualification.

The 'signposts' below identify the **potential** for Key Skills portfolio evidence gathering that can be naturally incorporated into the completion of each unit. Any Key Skills evidence will need to be separately assessed and must meet the relevant standard defined in the QCA document '*Key skills qualifications standards and guidance*' (available from **www.cityandguilds.com/keyskills**).

Unit number	Communication	Application of Number	Information and Communication Technology
201	C2.2		IT2.1

Unit number	Problem Solving	Improving Own Learning and Performance	Working With Others
201	PS2.1, PS2.2, PS2.3	LP2.3	

Appendix 2   Sources of general information

The following documents contain essential information for centres delivering City & Guilds qualifications. They should be referred to in conjunction with this handbook. To download the documents and to find other useful documents, go to the **Centres and Training Providers homepage** on **www.cityandguilds.com**.

Centre Guide – Delivering International Qualifications contains detailed information about the processes which must be followed and requirements which must be met for a centre to achieve 'approved centre' status, or to offer a particular qualification. Specifically, the document includes sections on:

- The centre and qualification approval process and forms
- Assessment, verification and examination roles at the centre
- Registration and certification of candidates
- Non-compliance
- Complaints and appeals
- Equal opportunities
- Data protection
- Frequently asked questions.

Providing City & Guilds qualifications – a guide to centre and qualification approval contains detailed information about the processes which must be followed and requirements which must be met for a centre to achieve 'approved centre' status, or to offer a particular qualification. Specifically, the document includes sections on:

- The centre and qualification approval process and forms
- Assessment, verification and examination roles at the centre
- Registration and certification of candidates
- Non-compliance
- Complaints and appeals
- Equal opportunities
- Data protection
- Frequently asked questions.

Ensuring quality contains updates and good practice exemplars for City & Guilds assessment and policy issues. Specifically, the document contains information on:

- Management systems
- Maintaining records
- Assessment
- Internal verification and quality assurance
- External verification.

Access to Assessment & Qualifications provides full details of the arrangements that may be made to facilitate access to assessments and qualifications for candidates who are eligible for adjustments in assessment.

The **centre homepage** section of the City & Guilds website also contains useful information such on such things as:

- **Walled Garden**
  Find out how to register and certificate candidates on line
- **Qualifications and Credit Framework (QCF)**

Contains general guidance about the QCF and how qualifications will change, as well as information on the IT systems needed and FAQs

- ***Events***
  Contains dates and information on the latest Centre events

- ***Online assessment***
  Contains information on how to register for GOLA assessments.

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Useful contacts

Type	Contact	Query
UK learners	T: +44 (0)20 7294 2800 E: learnersupport@cityandguilds.com	• General qualification information
International learners	T: +44 (0)20 7294 2885 F: +44 (0)20 7294 2413 E: intcg@cityandguilds.com	• General qualification information
Centres	T: +44 (0)20 7294 2787 F: +44 (0)20 7294 2413 E: centresupport@cityandguilds.com	• Exam entries • Registrations/enrolment • Certificates • Invoices • Missing or late exam materials • Nominal roll reports • Results
Single subject qualifications	T: +44 (0)20 7294 8080 F: +44 (0)20 7294 2413 F: +44 (0)20 7294 2404 (BB forms) E: singlesubjects@cityandguilds.com	• Exam entries • Results • Certification • Missing or late exam materials • Incorrect exam papers • Forms request (BB, results entry) • Exam date and time change
International awards	T: +44 (0)20 7294 2885 F: +44 (0)20 7294 2413 E: intops@cityandguilds.com	• Results • Entries • Enrolments • Invoices • Missing or late exam materials • Nominal roll reports
Walled Garden	T: +44 (0)20 7294 2840 F: +44 (0)20 7294 2405 E: walledgarden@cityandguilds.com	• Re-issue of password or username • Technical problems • Entries • Results • GOLA • Navigation • User/menu option problems
Employer	T: +44 (0)121 503 8993 E: business_unit@cityandguilds.com	• Employer solutions • Mapping • Accreditation • Development Skills • Consultancy
Publications	T: +44 (0)20 7294 2850 F: +44 (0)20 7294 3387	• Logbooks • Centre documents • Forms • Free literature

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