Industrial Graphics Skills 2024 v1.1

Applied senior syllabus

Queensland Government | Queensland Curriculum & Assessment Authority

For all Queensland schools

Contents

1 Queensland syllabuses for senior subjects

In Queensland, a syllabus for a senior subject is an official 'map' of a senior school subject. A syllabus's function is to support schools in delivering the Queensland Certificate of Education (QCE) system through high-quality and high-equity curriculum and assessment.

Syllabuses are based on design principles developed from independent international research about how excellence and equity are promoted in the documents teachers use to develop and enliven the curriculum.

Syllabuses for senior subjects build on student learning in the Prep to Year 10 Australian Curriculum and include General, General (Extension), Senior External Examination (SEE), Applied, Applied (Essential) and Short Course syllabuses.

More information about syllabuses for senior subjects is available at www.qcaa.qld.edu.au/senior/senior-subjects. and in the 'Queensland curriculum' section of the *QCE and QCIA policy and procedures handbook*.

Teaching, learning and assessment resources will support the implementation of a syllabus for a senior subject. More information about professional resources for senior syllabuses is available on the QCAA website and via the QCAA Portal.

2 Course overview

2.1 Rationale

Technologies are an integral part of society as humans seek to create solutions to improve their own and others' quality of life. Technologies affect people and societies by transforming, restoring and sustaining the world in which we live. In an increasingly technological and complex world, it is important to develop the knowledge, understanding and skills used by Australian manufacturing and construction industries to produce drawings. The manufacturing and construction industries transform raw materials into products required by society. This adds value for both enterprises and consumers. Australia has strong manufacturing and construction industries that continue to provide employment opportunities.

Industrial Graphics Skills includes the study of drafting industry practices and production processes through students' application in, and through a variety of industry-related learning contexts. Industry practices are used by drafting enterprises to manage production processes and the associated manufacture or construction of products from raw materials. Production processes include the drafting skills and procedures required to produce industry-specific technical drawings and graphical representations. Students engage in applied learning to demonstrate knowledge and skills in units that meet local needs, available resources and teacher expertise. Through both individual and collaborative learning experiences, students learn to meet client expectations of drawing standards.

Applied learning supports students' development of transferable 21st century, literacy and numeracy skills relevant to future employment opportunities in the building and construction, drafting, engineering and furnishing industrial sectors. Students learn to interpret drawings and technical information, and select and demonstrate manual and computerised drafting skills and procedures in relation to production processes. The majority of learning is done through drafting tasks that relate to business and industry. They work with each other to solve problems and complete practical work.

2.2 Syllabus objectives

The syllabus objectives outline what students have the opportunity to learn.

1. **Demonstrate practices, skills and procedures.**

   Students identify and reproduce fundamental industry skills in drafting tasks. These relate to enterprises, workplace health and safety, personal and interpersonal skills, product quality, tools and materials, sketches and drawings.

2. **Interpret client briefs and technical information.**

   Students use knowledge of industry practices and production processes to draw meaning from elements and critical features of client briefs. They collect and organise technical information by calculating quantities, measuring parts, identifying materials, finishes, fits, fasteners and joints and ascertaining requirements from charts, tables and technical manuals.

3. **Select practices, skills and procedures.**

   Students choose knowledge and skills to complete industry-specific drafting tasks. Knowledge and skills relate to enterprises, workplace health and safety, personal and interpersonal skills, product quality, tools and materials, sketches and drawings.

4. **Sequence processes.**

   Students use knowledge and understanding of industry practices to decide on the combination and order of production processes, including two- and three-dimensional freehand sketching, orthographic drawing, pictorial drawings, application of drawing conventions and standards, setup of computerised drawing environments, computerised assisted drawing, computer assisted modelling, computer assisted manufacturing, maintaining and operating equipment and managing information.

5. **Evaluate skills and procedures, and drawings.**

   Students determine the efficiency and effectiveness of production skills and procedures in relation to industry practices and specific drafting task requirements. They assess strengths, implications and limitations of drawings against expectations of quality derived from client briefs, conventions and standards required in industry-specific drafting tasks.

6. **Adapt plans, skills and procedures.**

   Students modify and improve drafting plans based on identified strengths, implications and limitations. They apply quality control measures to improve alignment of drawings with client briefs and technical information.

2.3 Designing a course of study in Industrial Graphics Skills

Syllabuses are designed for teachers to make professional decisions to tailor curriculum and assessment design and delivery to suit their school context and the goals, aspirations and abilities of their students within the parameters of Queensland's senior phase of learning.

The syllabus is used by teachers to develop curriculum for their school context. The term *course of study* describes the unique curriculum and assessment that students engage with in each school context. A course of study is the product of a series of decisions made by a school to select, organise and contextualise subject matter, integrate complementary and important learning, and create assessment tasks in accordance with syllabus specifications.

It is encouraged that, where possible, a course of study is designed such that teaching, learning and assessment activities are integrated and enlivened in an authentic setting.

2.3.1 Course structure

Industrial Graphics Skills is an Applied senior syllabus. It contains at least four QCAA-developed units from which schools develop their course of study.

Each unit has been developed with a notional time of 55 hours of teaching and learning, including assessment.

Schools select four units from the unit options provided. They decide the order in which the units will be delivered. Once these decisions have been made, the four units selected and their order of implementation determine which units are considered Units 1–4.

Students should complete Unit 1 and Unit 2 before beginning Units 3 and 4. Units 3 and 4 are studied as a pair.

More information about the requirements for administering senior syllabuses is available in the 'Queensland curriculum' section of the *QCE and QCIA policy and procedures handbook*.

2.3.2 Curriculum

Senior syllabuses set out only what is essential while being flexible so teachers can make curriculum decisions to suit their students, school context, resources and expertise.

Within the requirements set out in this syllabus and the *QCE and QCIA policy and procedures handbook*, schools have autonomy to decide:

- how and when subject matter is delivered
- how, when and why learning experiences are developed, and the context in which learning occurs
- how opportunities are provided in the course of study for explicit and integrated teaching and learning of complementary skills.

These decisions allow teachers to develop a course of study that is rich, engaging and relevant for their students.

2.3.3 Assessment

Senior syllabuses set out only what is essential while being flexible so teachers can make assessment decisions to suit their students, school context, resources and expertise.

Applied senior syllabuses contain assessment specifications and conditions for the assessment instruments that must be implemented with Units 3 and 4. These specifications and conditions ensure comparability, equity and validity in assessment.

Within the requirements set out in this syllabus and the *QCE and QCIA policy and procedures handbook*, schools have autonomy to decide:

- specific assessment task details
- assessment contexts to suit available resources
- how the assessment task will be integrated with teaching and learning activities
- how authentic the task will be.

In Unit 1 and Unit 2, schools:

- develop at least two but no more than four assessments
- complete at least one assessment for each unit
- ensure that each unit objective is assessed at least once.

In Units 3 and 4, schools develop four assessments using the assessment specifications and conditions provided in the syllabus.

More information about assessment in senior syllabuses is available in 'The assessment system' section of the *QCE and QCIA policy and procedures handbook*.

2.3.4 Subject matter

Each unit contains a unit description, unit objectives and subject matter. Subject matter is the body of information, mental procedures and psychomotor procedures (see Marzano & Kendall 2007, 2008) that are necessary for students' learning and engagement with the subject. Subject matter itself is not the specification of learning experiences but provides the basis for the design of student learning experiences.

Subject matter has a direct relationship with the unit objectives and provides statements of learning that have been constructed in a similar way to objectives.

2.3.5 Aboriginal perspectives and Torres Strait Islander perspectives

The QCAA is committed to reconciliation. As part of its commitment, the QCAA affirms that:

- Aboriginal peoples and Torres Strait Islander peoples are the first Australians, and have the oldest living cultures in human history
- Aboriginal peoples and Torres Strait Islander peoples have strong cultural traditions and speak diverse languages and dialects, other than Standard Australian English
- teaching and learning in Queensland schools should provide opportunities for students to deepen their knowledge of Australia by engaging with the perspectives of Aboriginal peoples and Torres Strait Islander peoples
- positive outcomes for Aboriginal students and Torres Strait Islander students are supported by successfully embedding Aboriginal perspectives and Torres Strait Islander perspectives across planning, teaching and assessing student achievement.

Guidelines about Aboriginal perspectives and Torres Strait Islander perspectives and resources for teaching are available at www.qcaa.qld.edu.au/k-12-policies/aboriginal-torres-strait-islander-perspectives.

Where appropriate, Aboriginal perspectives and Torres Strait Islander perspectives have been embedded in the subject matter.

2.3.6 Complementary skills

Opportunities for the development of complementary skills have been embedded throughout subject matter. These skills, which overlap and interact with syllabus subject matter, are derived from current education, industry and community expectations and encompass the knowledge, skills, capabilities, behaviours and dispositions that will help students live and work successfully in the 21st century.

These complementary skills are:

- literacy — the knowledge, skills, behaviours and dispositions about language and texts essential for understanding and conveying English language content
- numeracy — the knowledge, skills, behaviours and dispositions that students need to use mathematics in a wide range of situations, to recognise and understand the role of mathematics in the world, and to develop the dispositions and capacities to use mathematical knowledge and skills purposefully
- 21st century skills — the attributes and skills students need to prepare them for higher education, work, and engagement in a complex and rapidly changing world. These skills include critical thinking, creative thinking, communication, collaboration and teamwork, personal and social skills, and digital literacy. The explanations of associated skills are available at www.qcaa.qld.edu.au/senior/senior-subjects/general-subjects/21st-century-skills .

It is expected that aspects of literacy, numeracy and 21st century skills will be developed by engaging in the learning outlined in this syllabus. Teachers may choose to create additional explicit and intentional opportunities for the development of these skills as they design the course of study.

2.3.7 Additional subject-specific information

Additional subject-specific information has been included to support and inform the development of a course of study.

Risk management

Schools will need to appropriately manage the risks associated with equipment and materials used in this course of study.

Risk management processes will include safe operating procedures, record-keeping of maintenance and risk assessments for high-risk equipment.

Further information to assist schools with health and safety is available at https://education.qld.gov.au/initiatives-and-strategies/health-and-wellbeing/workplaces.

Support material to manage risks is available at https://education.qld.gov.au/initiatives-and-strategies/health-and-wellbeing/workplaces/safety/managing/industrial-technology-design.

2.4 Reporting

General information about determining and reporting results for senior syllabuses is provided in the 'Determining and reporting results' section of the *QCE and QCIA policy and procedures handbook*.

2.4.1 Reporting standards

Reporting standards are summary statements that describe typical performance at each of the five levels (A–E).

A
The student shows proficient demonstration of drafting industry practices, and skills and procedures when producing drawings. They demonstrate insightful and justified interpretation of client briefs and technical information. The student discerningly selects industry practices, production skills and procedures. When drafting they strategically sequence production processes. They provide insightful and justified evaluations of drafting skills and procedures and drawings. The student's adaptation of drafting plans, skills and procedures is insightful and justified when producing drawings.
B
The student shows efficient demonstration of drafting industry practices, and skills and procedures when producing drawings. They demonstrate detailed and supported interpretation of client briefs and technical information. The student thoroughly selects industry practices, and production skills and procedures. When drafting they consider how to sequence production processes. They provide detailed and supported evaluations of drafting skills and procedures and drawings. The student's adaptation of drafting plans, skills and procedures is detailed and supported when producing drawings.
C
The student shows demonstration of drafting industry practices, and skills and procedures when producing drawings. They demonstrate interpretation of client briefs and technical information. The student selects industry practices, and production skills and procedures. When drafting they sequence production processes. They provide evaluations of drafting skills and procedures and drawings. The student adapts drafting plans, skills and procedures when producing drawings.
D
The student shows rudimentary demonstration of drafting industry practices, and skills and procedures when producing drawings. They demonstrate narrow and unsupported interpretation of client briefs and technical information. The student inconsistently selects industry practices, and production skills and procedures. When drafting they inconsistently sequence production processes. They provide narrow and unsupported evaluations of drafting skills and procedures and drawings. The student's adaptation of drafting plans, skills or procedures is narrow and unsupported when producing incomplete drawings.
E
The student shows incorrect demonstration of drafting industry practices, and skills and procedures when producing drawings. They demonstrate superficial and unsubstantiated interpretation of client briefs and technical information. The student incorrectly selects industry practices, and production skills and procedures. When drafting they incorrectly sequence production processes. They provide superficial and unsubstantiated evaluations of drafting skills or procedures, and drawings. The student's adaptation of drafting skills and procedures is superficial and unsubstantiated when producing incomplete drawings.

2.4.2 Determining and reporting results

Unit 1 and Unit 2

Schools make A–E judgments on individual assessment instruments implemented in Unit 1 and Unit 2 using reporting standards.

Schools report results to the QCAA for students who complete Unit 1 and/or Unit 2. Results are reported as satisfactory (S) or unsatisfactory (U). Where appropriate, schools may also report a not rated (NR).

Units 3 and 4

Schools make A–E judgments on each of the four assessment instruments implemented in Units 3 and 4 using instrument-specific standards (ISS).

Schools report instrument results to the QCAA for students enrolled in Units 3 and 4 for each of the four assessments implemented. Where appropriate, schools may also report a not rated (NR).

Schools are also responsible for determining and reporting an A–E final subject result to the QCAA. The subject result is an on-balance judgment about how the pattern of evidence across the four assessments in Units 3 and 4 best matches the characteristics of the reporting standards at one of five levels (A–E).

3 Unit options

3.1 Unit option A: Drafting for residential building

In this unit, students explore drafting in the specialist area of residential building. They use knowledge of drafting industry practices and production processes to produce sketches, working drawings and 3D representations that enable the construction of domestic residential houses, extensions and renovations. They learn to interpret client briefs, technical information and design concepts produced by others such as builders, engineers and architects to draft residential building drawings to an industry standard. Students evaluate, make decisions about and adapt drafting plans, and production skills and procedures, and drawings, with the knowledge that the quality of drawings depends on client expectations of value, which affects building industry construction processes. Drawings produced in this unit are used to communicate details to professional, trade and consumer audiences.

3.1.1 Unit objectives

1. Demonstrate residential building drafting industry practices, and production skills and procedures.
2. Interpret residential building client briefs and technical information.
3. Select residential building drafting industry practices, and production skills and procedures.
4. Sequence residential building drafting production processes.
5. Evaluate residential building drafting production skills and procedures, and drawings.
6. Adapt residential building drafting plans, skills and procedures.

3.1.2 Subject matter

Pathways

- Recognise that a draftsperson in residential building is required to be licensed with the Queensland Building and Construction Commission (QBCC) as a building designer — low rise.
- Recognise the role of the licensed building designer — low rise, including to
  - prepare drawings and specifications for Class 1 and Class 10 buildings
  - prepare building documentation for compliance with legislation, codes and standards, including National Construction Codes (NCC) and local authority planning schemes
  - work with construction industry personnel and professional consultants.

Client briefs and technical information

- Recognise the construct of
  - client briefs, including client profile (role, demographics, expectations), purpose and audience, required drawings
  - technical requirements, including industry drawing conventions and standards, information on sketches and drawings, photographs, schedules of features, constraints (limitations or restrictions that must be considered, local government regulations, available time, physical realities of the site).
- Examine residential building drawings to identify
  - types of views and naming conventions
  - architectural conventions
  - residential building industry drawing conventions and standards extracted from selected sections of
    - AS 1100.101 Technical drawing — General principles
    - AS 1100.301 Technical drawing —– Architectural drawing
  - features represented on plans and elevations
  - sections of building and internal features
  - numerical information in drawings, including dimensions, sizes, quantities, ratios and scales
  - quality standards related to accuracy, consistency, completeness and compliance
  - documentation of changes, amendments and version control.
- Demonstrate that knowledge of residential building tools, construction processes and materials is required to draft effective drawings for use in the residential building industry, including
  - types and applications of structural materials, e.g. timber, steel, concrete and masonry
  - types and applications of cladding, e.g. internal lining, masonry, glass and insulation
  - construction processes, e.g. footing and slab methods, structural wall and roof framing, structural masonry, cladding systems.

- Interpret a
  - simple client brief to vary a standard project house design that includes client information and minimal technical information, e.g. based on the scenario that a consumer wishes to purchase a selected project home but requires minor variations to the design.
  - detailed client brief and technical information that includes concept sketches for renovations or extensions to an existing residence, e.g. verandah
  - selection of project builders' standard house plans and technical information to identify
    - a range of designs — quality, prices, styles, and sizes
    - specifications for the quality standards of fitting and inclusions
    - limitations on changes to design detail, room size, standard of fittings and inclusions
    - cost of variations
    - time and cost savings of the designs compared to custom designs.

Production processes

- Demonstrate 2D freehand sketching skills and procedures, including
  - plans and elevations
  - site plans
  - electrical and plumbing fit-out plans.
- Demonstrate the skills and procedures included in 2D orthogonal projection relevant to the drafting of 2D residential building plans, including
  - site plan
  - elevations
  - sectional views.
- Demonstrate the skills and procedures required to apply residential building industry drawing conventions and standards extracted from selected sections of
  - AS 1100.101 Technical drawing — General principles
  - AS 1100.301 Technical drawing — Architectural drawing.
- Demonstrate computerised drawing environment setup skills and procedures, including drawing interface, coordinate systems, orientation, drawing planes, layering strategy, templates, architectural library, text and dimension styles, line types, hatch patterns and title blocks.
- Demonstrate computerised drawing and editing command skills and procedures relevant to the drafting of
  - 2D residential building plans, e.g. site plan and elevation
  - 2D building plans, e.g. site plans, floor plans, elevations, sections, footing and slab plans, framing plans.

- Demonstrate drafting equipment maintenance skills and procedures, including
  - computer keyboard placement, cleaning and sanitising
  - monitor positioning and cleaning.
  - placement and ergonomic adjustment of work surfaces and seating.
- Demonstrate information management skills and procedures, including
  - importing and exporting files
  - file directories
  - archiving and version control.

Industry practices

- Recognise
  - that domestic building is a regulated activity under the Queensland Building and Construction Commission Act 1991 (Qld); all builders and most trade contractors must be licensed to carry out building work
  - the role of Queensland Building and Construction Commission QBCC to provide information, advice and regulation; Queensland Home Warranty Scheme; and resolution services
  - the different classes of buildings in the NCC 2019 Building Code of Australia
  - the responsibilities of the building designer in renovations, extensions and new builds, including
    - consulting with a licensed building certifier to assess and approve plans relating to new or altered buildings
    - considering siting requirements on a lot of land, e.g. size/slope/soil type
    - considering aspect (direction of sun/prevailing breezes)
    - adhering to setbacks/easements/zoning/height restrictions
    - considering environmental factors such as tree, animal habitat and heritage preservation rules
    - applying sustainability principles including energy efficient building design, heating and cooling, water conservation, choice of materials
    - applying relevant industry drawing conventions and standards.
- Select and demonstrate workplace health and safety practices in residential building drafting tasks, including the health and safety responsibilities of workers in residential building enterprises, including
  - workers on building sites must complete the general construction induction
  - procedures for identifying and reporting hazards, incidents and injuries
  - procedures for identifying and responding to incidents and emergencies
  - demonstrate healthy and safe office ergonomic practices when drafting drawings.

- Demonstrate industry-related personal attributes for residential building drafting, including
  - communication skills, including
    - reading residential building specialised vocabulary, abbreviations and acronyms
    - writing concise and technically accurate notes about residential building drawing production processes
    - oral skills, including speaking and listening to others, e.g. providing explanations, negotiating, asking clarifying questions and following instructions
  - teamwork, including individual responsibility and accountability
  - integrity, initiative, independence and work ethic.
- Document drafting plans, including written or spoken notes, diagrams, lists and tables of collected information, sketches, annotated photographs, annotated drawings, annotated screenshots and timeframe screenshot captures.
- Determine the sequence of drafting production processes required to draft residential building drawings, including
  - reading dimensions and calculating sizes and quantities from a 2D drawing and sketch
  - interpreting technical information, e.g. photographs and notes, to ascertain the types of drawings and views
  - identifying and collecting information about construction processes and materials to be represented in the drawings
  - using sketches and notes to organise the layout of information and views
  - identifying the extent to which relevant industry drawing standards and conventions need to be applied.
- Evaluate drafting production skills and procedures, and residential building drawings, using knowledge of industry practices, client briefs and technical information, including
  - selection and sequences of computerised drawing production processes
  - consistency of drawing with industry drawing conventions and standards
  - calculating and confirming dimensions, measurements and scale of drawings
  - suitability of drawings for the stated client purpose.
- Adapt drafting plans, skills and procedures, including
  - refining digital files of drawings
  - undoing and redrawing in CAD using alternative commands or processes to improve outcomes
  - annotating changes on drawings, e.g. comments/notes added to drawings printed to PDF
  - maintaining and tracking amendment versions of drawings
  - noting the implications of changes for consistency across drawings
  - preparing documentation of changes in the form of written or spoken notes.

3.2 Unit option B: Computer-aided manufacturing drafting

In this unit, students explore drafting in the specialist area of computer-aided manufacturing (CAM). They use knowledge of drafting industry practices and production processes to produce outputs from 2D and 3D digital representations. Outputs enable the manufacture or assembly of products such as household objects, tools, automotive and machine parts. Computer-aided manufacturing is used by manufacturing enterprises locally and internationally. Students learn to interpret client briefs and technical information. Students evaluate, make decisions about and adapt drafting plans, and production skills and procedures, and drawings, with the knowledge that the quality of the manufactured output depends on the quality of the drawing. Drawings produced in this unit are used to communicate details to manufacturing enterprises.

3.2.1 Unit objectives

1. Demonstrate computer-aided manufacturing drafting industry practices, and production skills and procedures.
2. Interpret computer-aided manufacturing client briefs and technical information.
3. Select computer-aided manufacturing drafting industry practices, and production skills and procedures.
4. Sequence computer-aided manufacturing drafting production processes.
5. Evaluate computer-aided manufacturing drafting production skills and procedures, drawings and outputs.
6. Adapt computer-aided manufacturing drafting plans, skills and procedures.

3.2.2 Subject matter

Pathways

- Recognise the role of the draftsperson in the industries that use CAM — automotive; aerospace and defence; medicine; energy; engineering; and construction.

Client briefs and technical information

- Recognise the construct of
  - client briefs, including client profile (role, demographics, expectations), purpose and audience, required output
  - technical requirements, including CAM drawing conventions, information on sketches and drawings, photographs, schedules of features, constraints (limitations or restrictions that must be considered, physical limitations of materials and equipment, available time).
- Examine CAM drawings to identify
  - types of views and naming conventions
  - industry drawing conventions and standards extracted from selected sections of AS 1100.101 Technical drawing — General principles
  - constraints of software, materials and machines
  - features represented in CAD drawings and related outputs
  - numerical information in CAD drawings, including dimensions, sizes, quantities, ratios and scales
  - quality standards of drawings related to accuracy, consistency, completeness, compliance that ensure the quality of outputs
  - documentation of changes, amendments and version control.
- Interpret client briefs and technical information to
  - manufacture a single-component object from a digital drawing, e.g. create a 3D-printed toy from a CAD model
  - reproduce a multi component object using CAM, e.g. container and lid.

Production processes

- Demonstrate 2D and 3D freehand sketching skills and procedures.
- Demonstrate drawing skills and procedures, including
  - interpretation of orthogonal drawings to identify the features of 3D forms
  - calculation and identification of sizes and quantities from a scale drawing
  - third order orthographic projections
  - pictorial representations (isometric) relevant to drawings and models for CAM
  - applying drawing conventions and standards.

- Demonstrate drawing conventions and quality standards for CAM, including the relationship between the drawings (i.e. CAD model) and the quality standard of the CAM output, including detail, finishes, accuracy, fit within a multicomponent model, suitability for CAM machine procedures.
- Demonstrate computerised drawing environment set up skills and procedures, including drawing interface, coordinate systems, orientation, drawing planes, layering strategy, templates, symbol library, text and dimension styles, line types, hatch patterns and title blocks.
- Demonstrate the computerised drawing and editing command skills and procedures required to create 3D models of an object for CAM, including, sketch, extrusion, revolve, fillets, chamfer, hole, swept.
- Demonstrate CAM equipment set up and operation skills and procedures, including
  - the range of machines and processes used in CAM, e.g. computer numerical control (CNC) routers, lathes and milling machines, 3D printers, laser cutters
  - safe operating procedures, risk assessments and training for CAM equipment
  - basic software operations that allow communication with CAM machine relevant to a range of machines and CAD software
  - differences in CAM software settings due to the properties and application of materials use, e.g. metals, polymers and composites.
- Demonstrate drafting and CAM equipment maintenance skills and procedures, including
  - computer keyboard placement, cleaning and sanitising
  - monitor positioning and cleaning
  - placement and ergonomic adjustment of work surfaces and seating
  - machine preparation and cleaning.
- Demonstrate information management skills and procedures, including
  - importing and exporting files
  - file directories
  - archiving and version control
  - export of STL files from CAD software to CAM equipment.

Industry practices

- Recognise
  - the evolution of manufacturing technology — the transition from manual machining to CAM, including
    - the benefits of using CAM, e.g. speed, efficiency, accuracy, consistency
    - how CAM outputs can form part of a multicomponent product
  - that reverse engineering is used where there is a need to remanufacture a physical part where the CAD data is not available. The process involves
    - measuring an object, often with 3D scanning technologies
    - reconstructing it as a 3D model and subsequently manufacturing a new object using CAM
  - that manufacturing enterprises use reverse engineering to
    - create a 3D model of a physical part with lost documentation
    - replace a one-off component
    - assess a competitor's products
    - analyse the working of a product
    - inspect and compare actual geometry with CAD model
    - measure wear of components.
- Select and demonstrate workplace health and safety practices in CAM drafting tasks, including
  - roles of designated health and safety personnel in manufacturing enterprises
  - principles of risk management — identify hazard, assess risk, consult and report, control hazard, review
  - procedures for identifying and reporting hazards, incidents and injuries
  - procedures for identifying and responding to incidents and emergencies.
  - use of personal protective equipment when producing CAM outputs.
- Demonstrate industry-related personal attributes for computer-aided manufacturing drafting, including
  - communication skills, including
    - reading computer-aided manufacturing specialised vocabulary, abbreviations and acronyms
    - writing concise and technically accurate notes about computer-aided manufacturing drawing production processes
    - oral skills, including speaking and listening to others, e.g. providing explanations, negotiating, asking clarifying questions and following instructions
  - teamwork, including individual responsibility and accountability
  - integrity, initiative, independence and work ethic.
- Document drafting plans, including written or spoken notes, diagrams, lists and tables of collected information, sketches, annotated photographs, annotated drawings, annotated screenshots and timeframe screenshot captures.

- Determine the sequence of drafting production processes required to draft computer-aided manufacturing drawings, including
  - measuring existing products with specialised measuring devices, e.g. vernier callipers and micrometres
  - sketching components and dimensioning
  - interpreting technical information to ascertain the drawing processes and outputs required
  - identifying and collecting information about materials and finishes
  - using sketches and notes to organise the layout of information and views
  - documenting a proposed sequence of drawing processes
  - identifying the extent to which relevant CAM standards and conventions need to be applied.
- Evaluate drafting production skills and procedures, and CAM drawings and outputs, using knowledge of industry practices, client briefs and technical information, including
  - measurement of output and comparison to original drawings, noting any variations to tolerances
  - selection and sequences of computerised drawing processes
  - consistency of drawing with conventions
  - calculating and confirming dimensions, measurements and scale of outputs
  - suitability of drawings and output for the stated client purpose
  - systems that effect the speed and efficiency of the process.
- Adapt drafting plans, skills and procedures, including
  - confirming changes have improved the physical output
  - monitoring the CAM modelling process and adjust the machine settings
  - redrawing drawings in CAD using alternative commands or processes to improve outcomes
  - annotating changes on drawings, e.g. comments/notes added to drawings printed to PDF
  - maintaining and tracking amendment versions of drawings
  - noting the implications of changes for consistency across drawings and photographs of outputs
  - preparing documentation of changes in the form of written or spoken notes.

3.3 Unit option C: Computer-aided drafting — modelling

In this unit, students explore drafting in the specialist area of computer-aided drafting — modelling (CAD modelling). They use knowledge of drafting industry practices and production processes to reproduce, modify, analyse and optimise designs using 3D solid modelling software. CAD modelling is used to digitally prototype design concepts devised by architects and industrial designers. Engineers use CAD modelling to analyse and optimise existing designed solutions. Students learn to interpret client briefs and technical information. They make decisions to evaluate and adapt drafting production processes, CAD models and ways of presenting models to an audience. The quality standard of the CAD model and presentation depends on the client's expectation of quality and value. Drawings produced in this unit are used to communicate details to professional, trade and consumer audiences.

3.3.1 Unit objectives

1. Demonstrate computer-aided drafting industry practices, and production skills and procedures.
2. Interpret computer-aided drafting client briefs and technical information.
3. Select computer-aided drafting industry practices, and production skills and procedures.
4. Sequence computer-aided drafting production processes.
5. Evaluate computer-aided drafting production skills and procedures, drawings and CAD models.
6. Adapt computer-aided drafting plans, skills and procedures.

3.3.2 Subject matter

Pathways

- Recognise that CAD models are created by specialist drafters who may be employed as part of a multidisciplinary team or contracted as a freelancer on a project-by-project basis.
- Recognise the role and knowledge required by a computer-aided designer, including
  - the need in the construction engineering, industrial, manufacturing, and automotive industries to create high-fidelity CAD models for use in sales or marketing presentations, product development and assembly instructions, and to improve comprehension of product features
  - possible CAD modeller careers in different industries and study requirements.

Client briefs and technical information

- Recognise the construct of
  - client briefs, including client profile (role, demographics, expectations), purpose and audience, required CAD model
  - technical requirements, including CAD model drawing conventions, information on sketches and drawings, photographs, schedules of features, constraints (limitations or restrictions that must be considered, physical realities, software limitations, available time).
- Examine CAD models to identify
  - types of views and naming conventions
  - industry drawing conventions and standards extracted from selected sections of AS 1100.101 Technical drawing — General principles
  - features and detail represented in the CAD model, e.g. surface finishes
  - numerical information able to be extracted from CAD models, including dimensions, length, area, volume, mass, centre of gravity, material quantities, ratios and scales
  - quality standards related to accuracy, consistency, completeness, compliance
  - documentation of changes, amendments and version control.
- Interpret client briefs and technical information to
  - present CAD models of single-component objects for an audience, e.g. household appliance
  - create animations of multi-component CAD models for an audience.

Production processes

- Demonstrate 2D and 3D freehand sketching skills and procedures, including using
  - the principles and procedures of orthogonal projection and pictorial representations to sketch objects
  - elements and principles of visual communication.
- Demonstrate the computerised drawing and editing command skills and procedures required to create 3D models of an object, including sketch, extrusion, revolve, fillets, chamfer, hole, sweep.
- Demonstrate computerised drawing environment setup skills and procedures, including drawing interface, coordinate systems, orientation, drawing planes, layering strategy, templates, pre-drawn library files, symbol library, text and dimension styles, line types, hatch patterns and title blocks.
- Demonstrate the skills and procedures included in computerised drawing and editing relevant to 2D drawings and 3D CAD models based on basic geometric forms, including
  - use of editing functions to modify 3D geometric shapes in creating 3D views
  - generation of wire line, surface and solid face displays in pictorial projections
  - generation of exploded or section perspective views of a model
  - generation of shadows, backgrounds and lighting effects for CAD models
  - application of surface finishes, materials and rendering techniques to create high-fidelity and realistic images
  - creating animations of multi-component objects in CAD software.
- Demonstrate skills and procedures using graphical presentation software and elements and principles of visual communication, including preparation of visual presentations using views exported from CAD modelling software, including
  - use of terminology (labels and notations) on drawings suitable to the intended audience and purpose
  - selection of views that communicate key features of the modelled object accordance to the purpose and intended audience.
- Demonstrate drafting equipment maintenance skills and procedures, including
  - computer keyboard placement, cleaning and sanitising
  - monitor positioning and cleaning
  - placement and ergonomic adjustment of work surfaces and seating.
- Demonstrate information management skills and procedures, including
  - importing and exporting files
  - file directories
  - archiving and version control.

Industry practices

- Recognise
  - the range and purposes of modelling software e.g. 3D modelling software, 2D software, virtual reality (VR) technology, rendering platforms
  - that CAD models for industry products are presented in a number of different formats depending on intended audience and intent, e. g. computerised slideshows, posters, concept drawings, web sites and assembly instructional booklets
  - that animations and walkthroughs are used in the industry for marketing and sales, product development, and to increase understanding of relationships and assembly
  - that an effective animation provides
    - movement to capture how components are joined, the real-life working of moving parts and their relationship to each other
    - interaction of the model with the intended use
    - communication features to suit the audience, e.g. voiceovers and musical accompaniments
  - that VR is an effective tool for personal interaction with a model and requires the export of the CAD model into VR interactive software.
- Select and demonstrate workplace health and safety practices in computer-aided drafting tasks, including
  - roles of designated health and safety personnel in manufacturing enterprises
  - principles of risk management — identify hazard, assess risk, consult and report, control hazard, review
  - procedures for identifying and reporting hazards, incidents and injuries
  - procedures for identifying and responding to incidents and emergencies
  - healthy and safe office ergonomic practices when working at a computer workstation.
- Demonstrate industry-related personal attributes for computer-aided drafting, including
  - communication skills, including
    - reading computer-aided drafting specialised vocabulary, abbreviations and acronyms
    - writing concise and technically accurate notes about computer-aided drafting drawing production processes
    - oral skills, including speaking and listening to others, e.g. providing explanations, negotiating, asking clarifying questions and following instructions
  - teamwork, including individual responsibility and accountability
  - integrity, initiative, independence and work ethic.
- Document drafting plans, including written or spoken notes, diagrams, lists and tables of collected information, sketches, annotated photographs, annotated drawings, annotated screenshots and timeframe screenshot captures.

- Determine the sequence of drafting production processes required to draft CAD drawings, including
  - identifying the animation and walkthrough command options of CAD modelling software
  - sketching and dimensioning the individual components of the object
  - using sketches and notes to organise the story boarding of the animation
  - identifying and collecting information about materials and finishes
  - documenting a proposed sequence of modelling processes
  - identifying the extent to which relevant industry standards and conventions need to be applied.
- Evaluate drafting production skills and procedures, and CAD drawings and models using knowledge of industry practices, client briefs and technical information, including
  - measurement of CAD model to original drawings, noting any variations to tolerances
  - selection and sequences of computerised drawing processes
  - consistency of drawing with conventions
  - calculating and confirming dimensions, measurements and scale of outputs
  - suitability of presentation images for the stated client purpose
  - quality standards related to accuracy, consistency, completeness, compliance.
- Adapt drafting plans, skills and procedures, including
  - refining or adapting CAD file
  - confirming changes have improved the representation of features
  - redrawing drawings in CAD using alternative commands or processes to improve outcomes
  - annotating changes on drawings, e.g. comments/notes added to drawings printed to PDF
  - maintaining and tracking amendment versions of drawings
  - noting the implications of changes for consistency across CAD model views and presentation drawing
  - preparing documentation of changes in the form of written or spoken notes.

3.4 Unit option D: Graphics for the construction industry

In this unit, students explore drafting in the industry area of construction. They use knowledge of drafting industry practices and production processes to produce sketches, working drawings and pictorial representations for civil works and commercial construction. Drawings for civil works enable the construction and maintenance of infrastructure such as roads, bridges, water supply, drainage and other utilities. Drawings for commercial construction enable the construction, fit-out and refurbishment of civil structures, including non-residential buildings and landscape structures. Students learn to interpret client briefs and technical information provided by drafting office line managers and professionals such as surveyors, civil engineers, architects, landscape architects and interior designers. Drawings must be drafted to specified industry standards. Students make decisions to evaluate and adapt drafting production processes and drawings with the knowledge that the quality of drawings depends on meeting the appropriate industry standard. The drawings are used to communicate construction details to professional and trade audiences.

3.4.1 Unit objectives

1. Demonstrate construction drafting industry practices, and production skills and procedures.
2. Interpret construction drafting client briefs and technical information.
3. Select construction drafting industry practices, and production skills and procedures.
4. Sequence construction drafting production processes.
5. Evaluate construction drafting production skills and procedures, and drawings.
6. Adapt construction drafting plans, skills and procedures.

3.4.2 Subject matter

Pathways

- Recognise
  - the role a draftsperson plays in assisting engineers, architects, surveyors, town planners, landscape architects, project managers, developers, local councils and state agencies in creating drawings for a prescribed purpose
  - that a drafter in commercial construction can be expected to work in multidisciplinary teams with a range of tradespeople and professionals on commercial projects such as offices, manufacturing premises, retail centres, non-residential buildings, parks and streetscapes
  - that a drafter prepares a range of drawings for different stages of commercial construction from development application to construction, e.g. site drawings, location drawings, engineering drawings, building drawings, survey drawings.

Client briefs and technical information

- Recognise the construct of
  - client briefs, including client profile (role, demographics, expectations), purpose and audience, required drawings
  - technical requirements, including industry drawing conventions and standards, information on sketches and drawings, photographs, schedules of features, constraints (limitations or restrictions that must be considered, government regulations, available time, physical realities of the site).
- Examine construction drawings to identify
  - survey drawings form the foundation for construction projects to establish constraints and limitations related to earthworks, existing services, slopes and natural or human made
  - types of views and naming conventions
  - construction industry drawing conventions and standards extracted from selected sections of
    - AS 1100.101 Technical drawing — General principles
    - AS 1100.301 Technical drawing — Architectural drawing
  - features represented on plans and elevations, e.g. sections of structures and internal features
  - numerical information in drawings, including dimensions, sizes, quantities, ratios and scales
  - quality standards related to accuracy, consistency, completeness, compliance
  - documentation of changes, amendments and version control.
- Interpret a selection of civil works drawings and technical information to identify
  - a range of works — roads, drainage, services
  - the data represented, e.g. contours, levels, cadastral boundaries, dimensions, existing services, position of structures, construction detailing
  - the terminology, codes, standards and conventions.

- Demonstrate that knowledge of construction tools, processes and materials is required to draft effective drawings for use in the construction industry, including
  - types and applications of materials, e.g. steel, concrete, masonry and glass
  - construction processes, e.g. earthworks, foundations, structural masonry, cladding systems
  - services, e.g. drainage, water reticulation, energy.
- Interpret client briefs and technical information
  - to draft 2D drawings of basic civil works, e.g. car park and entry road.
  - that includes concept sketches for a commercial construction, e.g. a proposed landscaped park.

Production processes

- Demonstrate 2D freehand sketching skills and procedures, including
  - showing a hierarchy of information with industry-specific symbols
  - 2D sectional and plan views.
- Demonstrate the principles and procedures of 2D orthogonal projection relevant to the drafting of 2D construction drawings, e.g. contour and detail drawings.
- Demonstrate construction industry drawing conventions and standards extracted from selected sections of
  - AS 1100.101 Technical drawing — General principles
  - AS 1100.301 Technical drawing — Architectural drawing.
- Demonstrate the computerised drawing and editing command skills and procedures required to create construction drawings, including
  - import survey drawings and overlay construction information using industry-specific 2D symbols and techniques
  - plot sectional ground lines from contours on a plan
  - calculate cuts-and-fills ratios and quantities from plans and sections
  - calculate slope falls from plan contours and sections
  - represent existing and proposed features on sectional views using industry-specific symbols and technique.
- Demonstrate computerised drawing environment setup skills and procedures, including drawing interface, coordinate systems, orientation, drawing planes, layering strategy, templates, symbol library, text and dimension styles, line types, hatch patterns and title blocks.
- Demonstrate drafting equipment maintenance skills and procedures, including
  - computer keyboard placement, cleaning and sanitising
  - monitor positioning and cleaning
  - placement and ergonomic adjustment of work surfaces and seating.
- Demonstrate information management skills and procedures, including
  - importing and exporting files
  - file directories
  - archiving and version control.

Industry practices

- Recognise industry practices relevant to the construction industry regarding customer expectations of drawing quality, including
  - the breadth and importance of the construction industry in Australia and its contribution to the economy and jobs
  - the role of government agencies in establishing conditions and constraints on a site and the stages of local council approval for a project
  - that governmental agencies and local councils establish codes, standards and conventions dependant on the classifications of a project
  - that Austroads Guides cover the design and construction of roads in Australia, e.g. intersections and crossings, turning paths, car spaces, geometric design, cross-sectional slopes.
- Select and demonstrate workplace health and safety practices in construction industry tasks, including
  - roles of designated health and safety personnel in construction industry enterprises
  - principles of risk management — identify hazard, assess risk, consult and report, control hazard, review
  - procedures for identifying and reporting hazards, incidents and injuries
  - procedures for identifying and responding to incidents and emergencies
  - healthy and safe office ergonomic practices when working at a computer workstation.
- Demonstrate industry-related personal attributes for the construction industry, including
  - communication skills, such as
    - reading construction industry specialised vocabulary, abbreviations and acronyms
    - writing concise and technically accurate notes about construction industry drawing production processes
    - oral skills, including speaking and listening to others, e.g. providing explanations, negotiating, asking clarifying questions and following instructions
  - teamwork, including individual responsibility and accountability
  - integrity, initiative, independence and work ethic.
- Document drafting plans, including written or spoken notes, diagrams, lists and tables of collected information, sketches, annotated photographs, annotated drawings, annotated screenshots and timeframe screenshot captures.

- Determine the sequence of drafting production processes required to draft construction industry drawings, including
  - interpreting contour and detail survey drawings
  - reading dimensions and calculating siting, sizes and quantities from a 2D drawing and sketch
  - interpreting technical information, e.g. photographs and notes, to ascertain the types of drawings and views
  - identifying and collecting information about commercial construction processes, materials and structures to be represented in the drawings
  - using sketches and notes to organise the layout of information and views
  - documenting a proposed sequence of drafting production processes
  - identifying the extent to which relevant industry drawing standards and conventions need to be applied.
- Evaluate drafting production skills and procedures, and construction industry drawings and CAD models, using knowledge of industry practices, client briefs and technical information, including
  - selection and sequences of computerised drafting processes
  - consistency of drawing with industry drawing conventions and standards
  - calculating and confirming dimensions, measurements and scale of drawings
  - suitability of drawings for the stated client purpose.
- Adapt drafting plans, skills and procedures, including
  - refining digital files of drawings
  - undoing and reproducing drawings in CAD using alternative commands or processes to improve outcomes
  - annotating changes on drawings e.g. comments/notes added to drawings printed to PDF
  - maintaining and tracking amendment versions of drawings
  - noting the implications of changes for consistency across drawings
  - preparing documentation of changes in the form of written or spoken notes.

3.5 Unit option E: Graphics for the engineering industry

In this unit, students explore drafting in the industry area of engineering. They use knowledge of drafting industry practices and production processes to produce sketches, working drawings and pictorial representations that enable the manufacture of predominantly metal products such as tools, automotive and marine parts, brackets, machine parts, moulds and ducting. Students learn to interpret client briefs and technical information provided by drafting office line managers, tradespeople and engineers. Drawings must be drafted to specified industry standards. Students make decisions to evaluate and adapt drafting production processes and drawings with the knowledge that the quality of drawings depends on meeting the appropriate industry standard. The drawings are used by tradespeople and manufacturing enterprises.

3.5.1 Unit objectives

1. Demonstrate engineering drafting industry practices, and production skills and procedures.
2. Interpret engineering drafting client briefs and technical information.
3. Select engineering drafting industry practices, and production skills and procedures.
4. Sequence engineering drafting production processes.
5. Evaluate engineering drafting production skills and procedures, and drawings.
6. Adapt engineering drafting plans, skills and procedures.

3.5.2 Subject matter

Pathways

- Recognise that
  - engineering enterprises employ draftspersons to prepare drawings to be used by tradespersons, including boilermakers, fitters, turners, mechanics, sheet metal fabricators, toolmakers to manufacture or repair primarily metal and polymer products
  - draftspersons in the engineering industry are provided with drawing information and requirements from mechanical engineers, industrial designers, supervisors and clients.

Client briefs and technical information

- Recognise the construct of
  - client briefs, including client profile (role, demographics, expectations), purpose and audience, required drawings
  - technical requirements, including industry drawing conventions and standards, information on sketches and drawings, photographs, schedules of features, constraints (limitations or restrictions that must be considered, available time, physical realities of the materials).
- Interpret engineering drawings to identify
  - types of views and naming conventions
  - engineering industry drawing conventions and standards extracted from selected sections of AS 1100.101 Technical drawing — General principles
  - numerical information in drawings, including dimensions, sizes, quantities, ratios and scales
  - quality standards related to accuracy, consistency, completeness, compliance
  - documentation of changes, amendments and version control
  - features represented on developments, e.g. layout, roll out, radial and triangulation techniques, seams, edge types, notchings, tabs, fold lines, fold lines, generators
  - features represented on detail drawings, e.g. component drawings, assembly drawings, rendered pictorial, sectioned views, exploded views, auxiliary views, dimensions, tolerances,
- Demonstrate that knowledge of engineering tools, manufacturing processes and materials is required to draft effective drawings for use in the engineering industry, including
  - types and applications of metals and polymers
  - standard sections, shapes and sizes
  - properties of metals and polymers, e.g. weldability, hardenability, machinability, workability, wear resistance
  - cutting, joining, machining, forming, finishing processes.
- Interpret client briefs and technical information to draft
  - sheet metal fabricated objects, e.g. ducting, hoods, framing, roofs, tanks, car bodies, airplane wings, internal fixtures, toolboxes, cabinets and storage units
  - engineered products with fits and tolerances.

Production processes

- Demonstrate sketching skills and procedures, including
  - 2D sketching skills using industry conventions for line types and symbols to create scaled views from a dimensioned image of an object
  - 3D sketching skills using industry conventions to create scaled isometric sketches from orthogonal drawings.
- Demonstrate application of the principles and procedures of
  - 2D third angle orthogonal projection relevant to the drafting of 2D engineering detail drawings, e.g. front view, top view, left side and right side views
  - 3D pictorial representations relevant to the drafting of engineering detail drawings.
- Demonstrate application of engineering industry drawing conventions and standards extracted from selected sections of AS 1100.101 Technical drawing — General principles.
- Demonstrate setup of computerised drafting environments, including drawing interface, coordinate systems, orientation, drafting planes, layering strategy, templates, symbol library, text and dimension styles, line types, hatch patterns, title blocks.
- Demonstrate the computerised drafting and editing command skills and procedures required to create engineering drawings, including fold out, roll out, radial, triangulation, auxiliary views, true shapes of sections.
- Demonstrate drafting equipment maintenance skills and procedures, including
  - computer keyboard placement, cleaning and sanitising
  - monitor positioning and cleaning
  - placement and ergonomic adjustment of work surfaces and seating.
- Demonstrate information management skills and procedures, including
  - importing and exporting files
  - file directories
  - archiving and version control.

Industry practices

- Recognise industry practices relevant to engineering industry, including
  - drafting for sheet metal and fabrication work includes developments for
    - air-conditioning ducting
    - aircraft repair, manufacture and assembly
    - stainless steel shop fitting manufacture and installation (benches, displays, industrial kitchen equipment)
    - repair of industrial machinery, e.g. guarding, switch-boards
  - drafting for fitting and machining work includes detail drawings for food-processing equipment, pumps, instruments, vices, tools, bicycle parts, metal sculptures, hose fittings, stub axles, heavy vehicle components and jacks.
- Select and demonstrate workplace health and safety practices in engineering enterprises, including
  - procedures for identifying and reporting hazards, incidents and injuries
  - procedures for identifying and responding to incidents and emergencies
  - healthy and safe office ergonomic practices when drafting drawings.

- Demonstrate industry-related personal attributes for the engineering industry, including
  - work-readiness skills, e.g. punctuality, ethical behaviour, diligence, respect for authority, demonstrating initiative
  - teamwork in the workplace, e.g. being involved in group discussions, working with people from diverse social, and cultural backgrounds
  - workplace communication using engineering industry-specific terminology
  - reading engineering industry specialised vocabulary, abbreviations and acronyms
  - writing concise and technically accurate notes about engineering drafting processes.
- Document drafting production processes, including written or spoken notes, diagrams, lists and tables of collected information, sketches, annotated photographs, annotated drawings, annotated screenshots, timeframe screenshot captures.
- Determine the sequence of drafting production processes required to draft engineering industry drawings, including
  - reading dimensions and calculating sizes and quantities from a 2D or 3D sketch
  - interpreting technical information, e.g. photographs and notes, to ascertain the types of drawings and views
  - performing measurements using steel rules, tape measures, vernier callipers and micrometres
  - performing computations to accurately work out sizes, areas, amounts of material
  - identifying and collecting information about manufacturing processes, (e.g. threads, welds, tolerances), materials and surface finishes to be represented in the drawings
  - using sketches and notes to organise the layout of information and views
  - documenting a proposed sequence of drafting processes
  - identifying the extent to which relevant industry drawing standards and conventions need to be applied.
- Evaluate strengths, limitations and implications of the drafting production skills and procedures and engineering drawings against the client brief and technical requirements, including
  - selection and sequences of computerised drafting processes
  - consistency of drawing with industry drawing conventions and standards
  - calculating and confirming dimensions, measurements and scale of drawings
  - suitability of drawings for the stated client purpose.
- Adapt engineering drafting production plans, skills and procedures to suit the client, including
  - refining digital files of drawings
  - undoing and redrawing plans in CAD using alternative commands or processes to improve outcomes
  - annotating changes on drawings, e.g. comments/notes added to drawings printed to PDF
  - maintaining and tracking amendment versions of drawings
  - noting the implications of changes for consistency across drawings
  - preparing documentation of changes in the form of written or spoken notes.

3.6 Unit option F: Graphics for the furnishing industry

In this unit, students explore drafting in the industry area of furnishing. They use knowledge of drafting industry practices and production processes to produce sketches, working drawings and pictorial representations that enable the manufacture of furnishings such as tables, chairs, storage systems, cabinets, kitchens and interior features. Students learn to interpret client briefs and technical information provided by drafting office line managers, tradespeople and designers. Drawings must be drafted to specified industry standards. Students make decisions to evaluate and adapt drafting production processes and drawings with the knowledge that the quality of drawings depends on meeting the appropriate industry standard. The drawings are used by tradespeople and manufacturing enterprises.

3.6.1 Unit objectives

1. Demonstrate furnishing drafting industry practices, and production skills and procedures.
2. Interpret furnishing drafting client briefs and technical information.
3. Select furnishing drafting industry practices, and production skills and procedures.
4. Sequence furnishing drafting production processes.
5. Evaluate furnishing drafting production skills and procedures, and drawings.
6. Adapt furnishing drafting plans, skills and procedures.

3.6.2 Subject matter

Pathways

- Recognise that
  - furnishing enterprises employ draftspersons to prepare drawings to be used by tradespersons, including furniture maker, cabinet maker, shop fitter, interior furnisher to manufacture furnishing products
  - draftspersons in the furnishing industry are provided with drawing information and requirements from interior designers, industrial designers, supervisors and clients.

Client briefs and technical information

- Identify the construct of
  - client briefs, including client profile (role, demographics, expectations), purpose and audience, required drawings
  - technical requirements, including industry drawing conventions and standards, information on sketches and drawings, photographs, schedules of features, constraints (limitations or restrictions that must be considered, available time, physical realities of the materials).
- Interpret furnishing drawings to identify
  - types of views and naming conventions
  - furnishing industry drawing conventions and standards extracted from selected sections of AS 1100.101 Technical drawing — General principles
  - numerical information in drawings, including dimensions, sizes, quantities, ratios and scales
  - quality standards related to accuracy, consistency, completeness, compliance
  - documentation of changes, amendments and version control.
  - features represented in drawings, e.g. orthographic views, sequences of assembly, detailed views, rendered pictorial of a finished component, open in line for assembly drawings, knock down fittings, finishes, assembly actions
  - features represented on detail drawings, e.g. component drawings, assembly drawings, rendered pictorial, sectioned views, exploded views, auxiliary views, 3D CAD models, dimensions, tolerances.
- Demonstrate that knowledge of furnishing tools, manufacturing processes and materials is required to draft effective drawings for use in the furnishing industry, including
  - types and applications of polymers, composites (including manufacture boards), metals, timbers
  - standard sections, shapes and sizes
  - properties of materials, e.g. colour, grain, strength, durability
  - cutting, joining, machining, forming, finishing processes.
- Interpret client briefs and technical information
  - to draft mass produced furnishings, e.g. flat-packed cupboard
  - that include concept sketches for bespoke furniture to draft detailed drawings.

Production processes

- Demonstrate sketching skills and procedures, including
  - 2D sketching skills using industry conventions for line types and symbols to create scaled views from a dimensioned image of an object
  - 3D sketching skills using industry conventions to create scaled isometric sketches from orthogonal drawings.
- Demonstrate application of the principles and procedures of
  - 2D third angle orthogonal projection relevant to the drafting of 2D furnishing detail drawings, e.g. front view, top view, left side and right side views
  - 3D pictorial representations relevant to the drafting of furnishing detail drawings.
- Demonstrate application of furnishing industry drawing conventions and standards extracted from selected sections of AS 1100.101 Technical drawing — General principles
- Demonstrate setup of computerised drafting environments, including drawing interface, coordinate systems, orientation, drawing planes, layering strategy, templates, symbol library, text and dimension styles, line types, hatch patterns, title blocks.
- Demonstrate the computerised drawing and editing command skills and procedures relevant to the drafting of 2D orthogonal views and 3D pictorial drawings including sequences of assembly, detailed views, rendered pictorial of a finished component, open in line for assembly drawings, component drawings, sectioned views, exploded views, auxiliary views, dimensions, tolerances.
- Demonstrate drafting equipment maintenance skills and procedures, including
  - computer keyboard placement, cleaning and sanitising
  - monitor positioning and cleaning
  - placement and ergonomic adjustment of work surfaces and seating.
- Demonstrate information management skills and procedures, including
  - importing and exporting files
  - file directories
  - archiving and version control.

Industry practices

- Recognise industry practices relevant to furnishing industry, including
  - drafting for mass produced furnishing work includes drawings of flat-pack furniture articles e.g. desks, bookcase, bedside tables
  - drafting for bespoke furniture includes drafting detail drawings for the manufacture of one-off furniture. Designs are created by industrial designers and the role of the draftsperson is to translate design concepts into accurate drawings that can be used by tradespeople to produce the item of furniture
  - bespoke furniture may have complex shapes and forms, e.g. Lockheed lounge.
- Select and demonstrate workplace health and safety practices in furnishing industry tasks, including
  - roles of designated health and safety personnel in construction industry enterprises
  - principles of risk management — identify hazard, assess risk, consult and report, control hazard, review
  - procedures for identifying and reporting hazards, incidents and injuries
  - procedures for identifying and responding to incidents and emergencies.
  - healthy and safe office ergonomic practices when working at a computer workstation.
- Demonstrate industry-related personal attributes for the furnishing industry, including
  - communication skills, including
    - reading furnishing industry specialised vocabulary, abbreviations and acronyms
    - writing concise and technically accurate notes about furnishing industry drawing production processes
    - oral skills, including speaking and listening to others e.g. providing explanations, negotiating, asking clarifying questions and following instructions
  - teamwork, including individual responsibility and accountability
  - integrity, initiative, independence and work ethic.
- Document drafting production processes, including written or spoken notes, diagrams, lists and tables of collected information, sketches, annotated photographs, annotated drawings, annotated screenshots, timeframe screenshot captures.
- Determine the sequence of drafting production processes required to draft furnishing industry drawings.
- Evaluate drafting production skills and procedures, and furnishing industry drawings using knowledge of industry practices, client briefs and technical information, including
  - selection and sequences of computerised drafting processes
  - consistency of drawing with industry drawing conventions and standards
  - calculating and confirming dimensions, measurements and scale of drawings
  - suitability of drawings for the stated client purpose.

- Adapt drafting production plans, skills and procedures, including
  - refining digital files of drawings
  - undoing and reproducing drawings in CAD using alternative commands or processes to improve outcomes
  - annotating changes on drawings, e.g. comments/notes added to drawings printed to PDF
  - maintaining and tracking amendment versions of drawings
  - noting the implications of changes for consistency across drawings
  - preparing documentation of changes in the form of written or spoken notes.

4 Assessment

4.1 Assessment A1: Practical demonstration — Residential building drafting

Students perform a practical demonstration when drafting residential building drawings and reflect on industry practices, production skills and procedures.

4.1.1 Assessment objectives

1. Demonstrate residential building drafting industry practices, and production skills and procedures.
2. Interpret residential building client briefs and technical information.
3. Select residential building drafting industry practices, and production skills and procedures.
5. Evaluate residential building drafting production skills and procedures, and drawings.

4.1.2 Specifications

This task requires students to:

- interpret a client brief and technical information
- identify the skills required to draft residential building technical drawings to show a minor variation to the building structure
- select industry practices, production skills and procedures
- annotate sketches, photographs and/or video footage to capture decision-making
- demonstrate production skills and procedures used in 3–5 production processes
- reflect on the industry practices, and production skills and procedures used to draft the drawings.

It is recommended that this task is designed so that students can develop a response in approximately 10 hours of class time.

Stimulus specifications

The teacher provides students with a client brief and technical information.

- The client brief must include the
  - client profile description, e.g. role, demographics, expectations
  - purpose of the variation to the building structure and the audience for the drawings
  - required drawings, e.g. 2D plan and elevations.
- The technical information must include the
  - proposed sequence of drafting production processes
  - required industry drawing standards
  - 2D and 3D drawings of the existing residence
  - sketch and description of the proposed variation to the residence, e.g. change of room sizes to a single-level project home.

4.1.3 Conditions

- Students can develop their responses in class time and their own time.
- This is an individual task.
- Students have access to drafting equipment as required to complete the assessment.
- Drawings drafted for Assessment A1 must be separate from the product component of Assessment A2.

4.1.4 Response requirements

Practical demonstration of residential building drafting

Drawings: the drafting skills and procedures used in 3–5 production processes

Documentation

Multimodal (at least two modes delivered at the same time): up to 3 minutes, 6 A4 pages, or equivalent digital media

4.1.5 Instrument-specific standards

Demonstrate	Interpret	Select	Evaluate	Grade
The student response has the following characteristics:				
• proficient demonstration of residential building drafting industry practices, and drafting skills and procedures when redrafting a residence with a minor variation	• insightful and justified interpretation of residential building client briefs and technical information when redrafting a residence with a minor variation	• discerning selection of residential building drafting industry practices, and skills and procedures when redrafting a residence with a minor variation	• insightful and justified evaluation of residential building drafting skills, procedures and residential building drawings	A
• efficient demonstration of residential building drafting industry practices, and drafting skills and procedures when redrafting a residence with a minor variation	• detailed and supported interpretation of residential building client briefs and technical information when redrafting a residence with a minor variation	• thorough selection of residential building drafting industry practices, and skills and procedures when redrafting a residence with a minor variation	• detailed and supported evaluation of residential building drafting skills, procedures and residential building drawings	B
• demonstration of residential building drafting industry practices, and drafting skills and procedures when redrafting a residence with a minor variation	• interpretation of residential building client briefs and technical information when redrafting a residence with a minor variation	• selection of residential building drafting industry practices, and skills and procedures when redrafting a residence with a minor variation	• evaluation of residential building drafting skills, procedures and residential building drawings	C
• rudimentary demonstration of residential drafting building industry practices, and drafting skills and procedures when redrafting a residence with a minor variation.	• narrow and unsupported interpretation of residential building client briefs and technical information when redrafting a residence with a minor variation.	• inconsistent selection of residential building drafting industry practices, and skills and procedures when redrafting a residence with a minor variation.	• narrow and unsupported evaluation of residential building drafting skills, procedures and residential building drawings.	D
The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	E

4.2 Assessment A2: Project — Residential building drafting

Students draft residential building drawings and document the drafting process.

4.2.1 Assessment objectives

1. Demonstrate residential building drafting industry practices, and production skills and procedures.
2. Interpret residential building client briefs and technical information.
3. Select residential building drafting industry practices, and production skills and procedures.
4. Sequence residential building drafting production processes.
5. Evaluate residential building drafting production skills and procedures, and drawings.
6. Adapt residential building drafting plans, skills and procedures.

4.2.2 Specifications

This task requires students to:

- draft a set of residential building drawings for a renovation or extension to an existing residence by
  - demonstrating drafting skills and procedures used in 5–7 production processes
  - interpreting a client brief and technical information
  - selecting industry practices, and production skills and procedures
  - adapting drafting plans, production skills and procedures during drafting to meet the requirements in the client brief and technical information
- document the drafting process by
  - interpreting client briefs and technical information for the drafting of residential building drawings
  - deciding on the industry practices, and production skills and procedures required to draft the drawings
  - determining the sequence in which the drafting processes will be implemented
  - annotating sketches, photographs and/or video footage to capture decision-making
  - reflecting on the quality of the completed drawings, industry practices, and production skills and procedures used to draft the drawings.

It is recommended that this task is designed so that students can develop a response in approximately 20 hours of class time.

Stimulus specifications

The teacher provides students with a client brief and technical information.

- The client brief must include the
  - client profile description, e.g. role, demographics, expectations
  - purpose of the renovation or extension and audience for the drawings
  - required drawings, e.g. the subset of the industry standard building drawings required.
- The technical information must include the
  - required industry drawing standards
  - 2D and 3D drawings of the existing residence
  - sketch and description of the proposed renovation or extension to the residence, e.g. verandah, pergola, carport.

4.2.3 Conditions

- Students can develop their responses in class time and their own time.
- This is an individual task.
- Students have access to drafting equipment as required to complete the assessment.

4.2.4 Response requirements

Residential building drawings

Drawings: residential building drawings drafted using the skills and procedures in 5–7 production processes

Drafting process

Multimodal (at least two modes delivered at the same time): up to 5 minutes, 8 A4 pages, or equivalent digital media

4.2.5 Instrument-specific standards

Demonstrate	Interpret	Select	Sequence	Evaluate	Adapt	Grade
The student response has the following characteristics:						
• proficient demonstration of residential building drafting industry practices, and skills and procedures when drafting a renovation or extension to an existing residence	• insightful and justified interpretation of residential building client briefs and technical information when drafting a renovation or extension to an existing residence	• discerning selection of residential building drafting industry practices, and skills and procedures when drafting a renovation or extension to an existing residence	• strategic sequencing of production processes when drafting a renovation or extension to an existing residence	• insightful and justified evaluation of production skills, procedures and residential building drawings	• insightful and justified adaptation of drafting plans, skills and procedures when drafting a renovation or extension to an existing residence	A
• efficient demonstration of residential building drafting industry practices, and skills and procedures when drafting a renovation or extension to an existing residence	• detailed and supported interpretation of residential building client briefs and technical information when drafting a renovation or extension to an existing residence	• thorough selection of residential building drafting industry practices, and skills and procedures when drafting a renovation or extension to an existing residence	• considered sequencing of production processes when drafting a renovation or extension to an existing residence	• detailed and supported evaluation of production skills, procedures and residential building drawings	• detailed and supported adaptation of drafting plans, skills and procedures when drafting a renovation or extension to an existing residence	B
• demonstration of residential building drafting industry practices, and skills and procedures when drafting a renovation or extension to an existing residence	• interpretation of residential building client briefs and technical information when drafting a renovation or extension to an existing residence	• selection of residential building drafting industry practices, and skills and procedures when drafting a renovation or extension to an existing residence	• sequencing of production processes when drafting a renovation or extension to an existing residence	• evaluation of production skills, procedures and residential building drawings	• adaptation of drafting plans, skills and procedures when drafting a renovation or extension to an existing residence	C

Demonstrate	Interpret	Select	Sequence	Evaluate	Adapt	Grade
• rudimentary demonstration of residential building drafting industry practices, and skills and procedures when drafting a renovation or extension to an existing residence.	• narrow and unsupported interpretation of residential building client briefs and technical information when drafting a renovation or extension to an existing residence.	• inconsistent selection of residential building drafting industry practices, and skills and procedures when drafting a renovation or extension to an existing residence.	• inconsistent sequencing of production processes when drafting a renovation or extension to an existing residence.	• narrow and unsupported evaluation of production skills, procedures and residential building drawings.	• narrow and unsupported adaptation of drafting plans, skills and procedures when drafting a renovation or extension to an existing residence.	D
The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	E

4.3 Assessment B1: Practical demonstration — Computer-aided manufacturing drafting

Students perform a practical demonstration when drafting using computer-aided manufacturing drawings and reflect on industry practices, production skills and procedures.

4.3.1 Assessment objectives

1. Demonstrate computer-aided drafting industry practices, and production skills and procedures.
2. Interpret computer-aided manufacturing client briefs and technical information.
3. Select computer-aided manufacturing drafting industry practices, and production skills and procedures.
5. Evaluate computer-aided manufacturing drafting production skills and procedures, drawings and outputs.

4.3.2 Specifications

This task requires students to:

- interpret a client brief and technical information
- identify the skills required to draft computer-aided manufacturing digital drawings
- select industry practices, production skills and procedures required to manufacture a single-component object from a drafted digital drawing
- demonstrate skills and procedures used in 3–5 production processes
- reflect on the industry practices, and production skills and procedures used to draft the digital drawings and a manufactured single-component object

It is recommended that this task is designed so that students can develop a response in approximately 10 hours of class time.

Stimulus specifications

The teacher provides students with a client brief and technical information.

- The client brief must include the
  - client profile description, e.g. role, demographics, expectations
  - purpose for the object to be manufactured.
- The technical information must include the
  - proposed sequence of drafting production processes
  - required industry drawing and manufacturing standards
  - digital file requirements for output
  - dimensioned sketch and description of the single-component object. e.g. toy building block, furniture handle, key fob.

4.3.3 Conditions

- Students can develop their responses in class time and their own time.
- This is an individual task.
- Students have access to manufacturing and drafting equipment as required to complete the assessment
- The object manufactured and drawings drafted for Assessment B1 must be separate from the product component of Assessment B2.

4.3.4 Response requirements

Practical demonstration of computer-aided manufacturing drafting

Drawings: the drafting skills and procedures used in 3–5 production processes

Documentation

Multimodal (at least two modes delivered at the same time): up to 3 minutes, 6 A4 pages, or equivalent digital media

4.3.5 Instrument-specific standards

Demonstrate	Interpret	Select	Evaluate	Grade
The student response has the following characteristics:				
• proficient demonstration of computer-aided manufacturing drafting industry practices, skills and drafting procedures when manufacturing a single-component object from a drafted digital drawing	• insightful and justified interpretation of computer-aided manufacturing client briefs and technical information when manufacturing a single-component object from a drafted digital drawing	• discerning selection of computer-aided manufacturing drafting industry practices, and skills and procedures when manufacturing a single-component object from a drafted digital drawing	• insightful and justified evaluation of computer-aided manufacturing drafting skills, procedures and models when manufacturing a single-component object from a drafted digital drawing	A
• efficient demonstration of computer-aided manufacturing drafting industry practices, skills and drafting procedures when manufacturing a single-component object from a drafted digital drawing	• detailed and supported interpretation of computer-aided manufacturing client briefs and technical information when manufacturing a single-component object from a drafted digital drawing	• thorough selection of computer-aided manufacturing drafting industry practices, and skills and procedures when manufacturing a single-component object from a drafted digital drawing	• detailed and supported evaluation of computer-aided manufacturing drafting skills, procedures and models when manufacturing a single-component object from a drafted digital drawing	B
• demonstration of computer-aided manufacturing drafting industry practices, skills and drafting procedures when manufacturing a single-component object from a drafted digital drawing	• interpretation of computer-aided manufacturing client briefs and technical information when manufacturing a single-component object from a drafted digital drawing	• selection of computer-aided manufacturing drafting industry practices, and skills and procedures when manufacturing a single-component object from a drafted digital drawing	• evaluation of computer-aided manufacturing drafting skills, procedures and models when manufacturing a single-component object from a drafted digital drawing	C
• rudimentary demonstration of computer-aided manufacturing drafting industry practices, skills and drafting procedures when manufacturing a single-component object from a drafted digital drawing.	• narrow and unsupported interpretation of computer-aided manufacturing client briefs and technical information when manufacturing a single-component object from a drafted digital drawing.	• inconsistent selection of computer-aided manufacturing drafting industry practices, and skills and procedures when manufacturing a single-component object from a drafted digital drawing.	• narrow and unsupported evaluation of computer-aided manufacturing drafting skills, procedures and models when manufacturing a single-component object from a drafted digital drawing.	D
The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	E

4.4 Assessment B2: Project — Computer-aided manufacturing drafting

Students draft multi-component object drawings and document the drafting process.

4.4.1 Assessment objectives

1. Demonstrate computer-aided manufacturing drafting industry practices, production skills and procedures.
2. Interpret computer-aided manufacturing client briefs and technical information.
3. Select computer-aided manufacturing drafting industry practices, production skills and procedures required to manufacture a multi-component object from a drafted digital drawing.
4. Sequence computer-aided manufacturing drafting production processes.
5. Evaluate computer-aided manufacturing drafting production skills and procedures, and drawings and outputs.
6. Adapt computer-aided manufacturing drafting plans, skills and procedures.

4.4.2 Specifications

This task requires students to:

- draft digital drawings that reproduce a multi-component object using CAM by
  - demonstrating drafting skills and procedures used in 5–7 production processes
  - interpreting a client brief and technical information
  - selecting industry practices, and production skills and procedures required to reproduce a multi-component object from a drafted digital drawing
  - adapting drafting plans, production skills and procedures during the drafting and manufacture of a multi-component object to meet the requirements in the client brief and technical information
- document the drafting process by
  - interpreting client briefs and technical information for the drafting of a multi-component drawing and object
  - deciding on the industry practices, and production skills and procedures required to draft the drawings
  - determining the sequence in which the drafting processes will be implemented
  - annotating sketches, photographs and/or video footage to capture decision-making
  - reflecting on the quality of the completed drawings, industry practices, and production skills and procedures used to draft the digital drawings and a manufactured multi-component object.

It is recommended that this task is designed so that students can develop a response in approximately 20 hours of class time.

Stimulus specifications

The teacher provides students with a client brief and technical information.

- The client brief must include the
  - client profile description, e.g. role, demographics, expectations
  - purpose and audience for the multi-component object
  - required drawings.
- The technical information must include
  - the required industry drawing standards
  - the digital file requirements for output
  - a set of multi-component objects that can be reproduced.

4.4.3 Conditions

- Students can develop their responses in class time and their own time.
- This is an individual task.
- Students have access to manufacturing and drafting equipment as required to complete the assessment.

4.4.4 Response requirements

Multi-component drawing and object

Drawings: multi-component digital drawing and object drafted using the skills and procedures used in 5–7 production processes

Drafting process

Multimodal (at least two modes delivered at the same time): up to 5 minutes, 8 A4 pages, or equivalent digital media

4.4.5 Instrument-specific standards

Demonstrate	Interpret	Select	Sequence	Evaluate	Adapt	Grade
The student response has the following characteristics:						
• proficient demonstration of computer-aided manufacturing drafting industry practices, skills and procedures when manufacturing a multi-component object from a drafted digital drawing	• insightful and justified interpretation of computer-aided manufacturing client briefs and technical information when manufacturing a multi-component object from a drafted digital drawing	• discerning selection of computer-aided manufacturing drafting industry practices, and skills and procedures when manufacturing a multi-component object from a drafted digital drawing	• strategic sequencing of production processes when manufacturing a multi-component object from a drafted digital drawing	• insightful and justified evaluation of production skills, and procedures and digital drawings and outputs	• insightful and justified adaptation of drafting plans, skills and procedures when manufacturing a multi-component object from a drafted digital drawing	A
• efficient demonstration of computer-aided manufacturing drafting industry practices, skills and procedures when manufacturing a multi-component object from a drafted digital drawing	• detailed and supported interpretation of computer-aided manufacturing client briefs and technical information when manufacturing a multi-component object from a drafted digital drawing	• thorough selection of computer-aided manufacturing drafting industry practices, and skills and procedures when manufacturing a multi-component object from a drafted digital drawing	• considered sequencing of production processes when manufacturing a multi-component object from a drafted digital drawing	• detailed and supported evaluation of production skills, and procedures and digital drawings and outputs	• detailed and supported adaptation of drafting plans, skills and procedures when manufacturing a multi-component object from a drafted digital drawing	B
• demonstration of computer-aided manufacturing drafting industry practices, skills and procedures when manufacturing a multi-component object from a drafted digital drawing	• interpretation of computer-aided manufacturing client briefs and technical information when manufacturing a multi-component object from a drafted digital drawing	• selection of computer-aided manufacturing drafting industry practices, and skills and procedures when manufacturing a multi-component object from a drafted digital drawing	• sequencing of production processes when manufacturing a multi-component object from a drafted digital drawing	• evaluation of production skills, and procedures and digital drawings and outputs	• adaptation of drafting plans, skills and procedures when manufacturing a multi-component object from a drafted digital drawing	C

Demonstrate	Interpret	Select	Sequence	Evaluate	Adapt	Grade
• rudimentary demonstration of computer-aided manufacturing drafting industry practices, skills and procedures when manufacturing a multi-component object from a drafted digital drawing.	• narrow and unsupported interpretation of computer-aided manufacturing client briefs and technical information when manufacturing a multi-component object from a drafted digital drawing.	• inconsistent selection of computer-aided manufacturing drafting industry practices, and skills and procedures when manufacturing a multi-component object from a drafted digital drawing.	• inconsistent sequencing of production processes when manufacturing a multi-component object from a drafted digital drawing.	• Narrow and unsupported evaluation of production skills, and procedures and digital drawings and outputs.	• narrow and unsupported adaptation of drafting plans, skills and procedures when manufacturing a multi-component object from a drafted digital drawing	D
The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	E

4.5 Assessment C1: Practical demonstration — Computer-aided drafting

Students perform a practical demonstration when drafting computer-aided drawings and reflect on industry practices, production skills and procedures.

4.5.1 Assessment objectives

1. Demonstrate computer-aided drafting industry practices, and production skills and procedures.
2. Interpret computer-aided drafting client briefs and technical information.
3. Select computer-aided drafting industry practices, and production skills and procedures.
5. Evaluate computer-aided drafting production skills and procedures, drawings and CAD models.

4.5.2 Specifications

This task requires students to:

- interpret a client brief and technical information
- identify the skills required to draft computer-aided digital drawings
- select industry practices, production skills and procedures required to present a CAD model from a drafted digital drawing
- demonstrate skills and procedures used in 3–5 production processes
- reflect on the industry practices, and production skills and procedures used to present a CAD model from a drafted digital drawing of a single-component product.

It is recommended that this task is designed so that students can develop a response in approximately 10 hours of class time.

Stimulus specifications

The teacher provides students with a client brief and technical information.

- The client brief must include the
  - client profile description, e.g. role, demographics, expectations
  - purpose and audience for the presentation
  - required drawings (3D CAD model and rendered pictorial views).
- The technical information must include the
  - proposed sequence of drafting production processes
  - required industry drawings and standards
  - dimensioned drawing and photograph of the single-component object, e.g. child's toy, household appliance.

4.5.3 Conditions

- Students can develop their responses in class time and their own time.
- This is an individual task.
- Students have access to drafting equipment as required to complete the assessment
- Drawings drafted for Assessment C1 must be separate from the product component of Assessment C2.

4.5.4 Response requirements

Practical demonstration of computer-aided drafting

Drawings: the drafting skills and procedures used in 3–5 production processes

Documentation

Multimodal (at least two modes delivered at the same time): up to 3 minutes, 6 A4 pages, or equivalent digital media

4.5.5 Instrument-specific standards

Demonstrate	Interpret	Select	Evaluate	Grade
The student response has the following characteristics:				
• proficient demonstration of computer-aided drafting industry practices, skills and procedures when drafting and presenting a CAD model of a single-component product	• insightful and justified interpretation of computer-aided drafting client briefs and technical information when drafting and presenting a CAD model of a single-component product	• discerning selection of computer-aided drafting industry practices and skills and procedures when drafting and presenting a CAD model of a single-component product	• insightful and justified evaluation of computer-aided drafting skills, procedures and models when drafting and presenting a CAD model of a single-component product	A
• efficient demonstration of computer-aided drafting industry practices, skills and procedures when drafting and presenting a CAD model of a single-component product	• detailed and supported interpretation of computer-aided drafting client briefs and technical information when drafting and presenting a CAD model of a single-component product	• thorough selection of computer-aided drafting industry practices and skills and procedures when drafting and presenting a CAD model of a single-component product	• detailed and supported evaluation of computer-aided drafting skills, procedures and models when drafting and presenting a CAD model of a single-component product	B
• demonstration of computer-aided drafting industry practices, skills and procedures when drafting and presenting a CAD model of a single-component product	• interpretation of computer-aided drafting client briefs and technical information when drafting and presenting a CAD model of a single-component product	• selection of computer-aided drafting industry practices and skills and procedures when drafting and presenting a CAD model of a single-component product	• evaluation of computer-aided drafting skills, procedures and models when drafting and presenting a CAD model of a single-component product	C
• rudimentary demonstration of computer-aided drafting industry practices, skills and procedures when drafting and presenting a CAD model of a single-component product.	• narrow and unsupported interpretation of computer-aided drafting client briefs and technical information when drafting and presenting a CAD model of a single-component product.	• Inconsistent selection of computer-aided drafting industry practices and skills and procedures when drafting and presenting a CAD model of a single-component product.	• narrow and unsupported evaluation of computer-aided drafting skills, procedures and models when drafting and presenting a CAD model of a single-component product.	D
The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	E

4.6 Assessment C2: Project — Computer-aided drafting

Students draft CAD model drawings and document the drafting process.

4.6.1 Assessment objectives

1. Demonstrate computer-aided drafting industry practices, and production skills and procedures.
2. Interpret computer-aided drafting client briefs and technical information.
3. Select computer-aided drafting industry practices, and production skills and procedures in drafting tasks required to draft animations from CAD models.
4. Sequence computer-aided drafting production processes.
5. Evaluate computer-aided drafting production skills and procedures, and drawings and animations.
6. Adapt computer-aided drafting plans, skills and procedures.

4.6.2 Specifications

This task requires students to:

- draft digital drawings to create an animation of a multi-component CAD model by
  - demonstrating drafting skills and procedures used in 5–7 production processes
  - interpreting a client brief and technical information
  - selecting industry practices, and production skills and procedures required to draft animations from CAD models.
  - Adapting drafting plans, production skills and procedures during drafting and animations of a multi-component CAD model to meet the requirements in the client brief and technical information
- document the drafting process by
  - interpreting client briefs and technical information for the drafting of a multi-component CAD model and animation
  - deciding on the industry practices, and production skills and procedures required to draft animations from CAD models.
  - determining the sequence in which the drafting processes will be implemented
  - annotating sketches, photographs and/or video footage to capture decision-making
  - reflecting on the quality of the completed drawings, industry practices, and production skills and procedures used to draft a multi-component CAD model and animation.

It is recommended that this task is designed so that students can develop a response in approximately 20 hours of class time.

Stimulus specifications

The teacher provides students with a client brief and technical information.

- The client brief must include the
  - client profile description, e.g. role, demographics, expectations
  - purpose and audience for the animation
  - required form of animation output.
- The technical information must include the
  - required industry drawing standards
  - 2D and 3D drawings and photograph of the multi-component object, e.g. household appliance.

4.6.3 Conditions

- Students can develop their responses in class time and their own time.
- This is an individual task.
- Students have access to drafting equipment as required to complete the assessment.

4.6.4 Response requirements

Multi-component CAD model drawing and animation

Drawings: multi-component CAD model digital drawing and animation using the skills and procedures used in 5–7 production processes

Drafting process

Multimodal (at least two modes delivered at the same time): up to 5 minutes, 8 A4 pages, or equivalent digital media

4.6.5 Instrument-specific standards

Demonstrate	Interpret	Select	Sequence	Evaluate	Adapt	Grade
The student response has the following characteristics:						
• proficient demonstration of computer-aided drafting industry practices, skills and drawing procedures when drafting a multi-component CAD model and animation	• insightful and justified interpretation of computer-aided drafting client briefs and technical information when drafting a multi-component CAD model and animation	• discerning selection of computer-aided drafting industry practices and skills and procedures information when drafting a multi-component CAD model and animation	• strategic sequencing of production processes when drafting a multi-component CAD model and animation	• insightful and justified evaluation of production skills, and procedures and digital drawings and models	• insightful and justified adaptation of computer-aided drafting industry practices and skills and procedures when drafting a multi-component CAD model and animation	A
• efficient demonstration of computer-aided drafting industry practices, skills and drawing procedures when drafting a multi-component CAD model and animation	• detailed and supported interpretation of computer-aided drafting client briefs and technical information when drafting a multi-component CAD model and animation	• thorough selection of computer-aided drafting industry practices and skills and procedures information when drafting a multi-component CAD model and animation	• considered sequencing of production processes when drafting a multi-component CAD model and animation	• detailed and supported evaluation of production skills, and procedures and digital drawings and models	• detailed and supported adaptation of computer-aided drafting industry practices and skills and procedures when drafting a multi-component CAD model and animation	B
• demonstration of computer-aided drafting industry practices, skills and drawing procedures when drafting a multi-component CAD model and animation	• interpretation of computer-aided drafting client briefs and technical information when drafting a multi-component CAD model and animation	• selection of computer-aided drafting industry practices and skills and procedures information when drafting a multi-component CAD model and animation	• sequencing of production processes when drafting a multi-component CAD model and animation	• evaluation of production skills, and procedures and digital drawings and models	• adaptation of computer-aided drafting industry practices and skills and procedures when drafting a multi-component CAD model and animation	C

Demonstrate	Interpret	Select	Sequence	Evaluate	Adapt	Grade
• rudimentary demonstration of computer-aided drafting industry practices, skills and drawing procedures when drafting a multi-component CAD model and animation.	• narrow and unsupported interpretation of computer-aided drafting client briefs and technical information when drafting a multi-component CAD model and animation.	• inconsistent selection of computer-aided drafting industry practices and skills and procedures information when drafting a multi-component CAD model and animation.	• inconsistent sequencing of production processes when drafting a multi-component CAD model and animation.	• narrow and unsupported evaluation of production skills, and procedures and digital drawings and models	• narrow and unsupported adaptation of computer-aided drafting industry practices and skills and procedures when drafting a multi-component CAD model and animation.	D
The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	E

4.7 Assessment D1: Practical demonstration — Construction industry drafting

Students perform a practical demonstration when drafting construction industry drawings and reflect on industry practices and production skills and procedures.

4.7.1 Assessment objectives

1. Demonstrate construction drafting industry practices, and production skills and procedures.
2. Interpret construction industry client briefs and technical information.
3. Select construction drafting industry practices, and production skills and procedures.
5. Evaluate construction drafting production skills and procedures, and drawings.

4.7.2 Specifications

This task requires students to:

- interpret a client brief and technical information
- identify the skills required to draft civil works drawings
- select industry practices, production skills and procedures
- annotate sketches, photographs and/or video footage to capture decision-making
- demonstrate production skills and procedures used in 3–5 production processes
- reflect on the industry practices and production skills and procedures used to draft the drawings.

It is recommended that this task is designed so that students can develop a response in approximately 10 hours of class time.

Stimulus specifications

The teacher provides students with a client brief and technical information.

- The client brief must include the
  - client profile description, e.g. role, demographics, expectations
  - purpose for the drawings
  - required drawings for the client, e.g. 2D plan and cross sections.
- The technical information must include
  - the proposed sequence of drafting production processes
  - the required construction industry drawing standards
  - a level and detailed survey drawing of the site
  - a sketch and description of the proposed works, e.g. car parking area and entry road, not exceeding 20 car spaces.

4.7.3 Conditions

- Students can develop their responses in class time and their own time.
- This is an individual task.
- Students have access to drafting equipment as required to complete the assessment.
- Drawings drafted for Assessment D1 must be separate from the product component of Assessment D2.

4.7.4 Response requirements

Practical demonstration of construction industry drafting

Drawings: the drafting skills and procedures used in 3–5 production processes

Documentation

Multimodal (at least two modes delivered at the same time): up to 3 minutes, 6 A4 pages, or equivalent digital media

4.7.5 Instrument-specific standards

Demonstrate	Interpret	Select	Evaluate	Grade
The student response has the following characteristics:				
• proficient demonstration of construction drafting industry practices, skills and procedures when drafting 2D plans for basic civil works	• insightful and justified interpretation of construction industry client briefs and technical information when drafting 2D plans for basic civil works	• discerning selection of construction drafting industry practices and skills and procedures when drafting 2D plans for basic civil works	• insightful and justified evaluation of construction drafting production skills, procedures and 2D plans for basic civil works	A
• efficient demonstration of construction drafting industry practices, skills and procedures when drafting 2D plans for basic civil works	• detailed and supported interpretation of construction industry client briefs and technical information when drafting 2D plans for basic civil works	• thorough selection of construction drafting industry practices and skills and procedures when drafting 2D plans for basic civil works	• detailed and supported evaluation of construction drafting production skills, procedures and 2D plans for basic civil works	B
• demonstration of construction drafting industry practices, skills and procedures when drafting 2D plans for basic civil works	• interpretation of construction industry client briefs and technical information when drafting 2D plans for basic civil works	• selection of construction drafting industry practices and skills and procedures when drafting 2D plans for basic civil works	• evaluation of construction drafting production skills, procedures and 2D plans for basic civil works	C
• rudimentary demonstration of construction drafting industry practices, skills and procedures when drafting 2D plans for basic civil works.	• narrow and unsupported interpretation of construction industry client briefs and technical information when drafting 2D plans for basic civil works.	• inconsistent selection of construction drafting industry practices and skills and procedures when drafting 2D plans for basic civil works.	• narrow and unsupported evaluation of construction drafting production skills, procedures and 2D plans for basic civil works.	D
The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	E

4.8 Assessment D2: Project — Construction industry drafting

Students draft construction industry drawings and document the drafting process in response to a provided client brief and technical information.

4.8.1 Assessment objectives

1. Demonstrate construction drafting industry practices, and production skills and procedures.
2. Interpret construction drafting client briefs and technical information.
3. Select construction drafting industry practices, and production skills and procedures.
4. Sequence construction drafting production processes.
5. Evaluate construction drafting production skills and procedures, and drawings.
6. Adapt construction drafting plans, skills and procedures.

4.8.2 Specifications

This task requires students to:

- draft a set of construction drawings for a non-residential commercial structure by
  - interpreting a client brief and technical information
  - selecting construction drafting industry practices, and production skills and procedures
  - adapting drafting plans, production skills and procedures during drafting to meet the requirements in the client brief and technical information
- document the drafting production process by
  - interpreting client briefs and technical information for the drafting of construction drawings
  - deciding on the industry practices, and production skills and procedures required to draft the drawings
  - determining the sequence in which the drafting processes will be implemented
  - annotating sketches, photographs and/or video footage to capture decision-making
  - reflecting on the quality of the completed drawings, industry practices, and production skills and procedures used to draft the drawings.

It is recommended that this task is designed so that students can develop a response in approximately 20 hours of class time.

Stimulus specifications

The teacher provides students with a client brief and technical information.

- The client brief must include the
  - client profile description, e.g. role, demographics, expectations
  - purpose and audience for the drawings
  - required drawings, e.g. the subset of the industry standard construction drawings required.
- The technical information must include
  - the required industry drawing standards
  - a level and detail survey plan of the site
  - the sketch and description of a non-residential commercial structure, e.g. the hardscape for a park.

4.8.3 Conditions

- Students can develop their responses in class time and their own time.
- This is an individual task.
- Students have access to drafting equipment as required to complete the assessment.

4.8.4 Response requirements

Construction drawings

Drawings: construction industry drawings drafted using the skills and procedures in 5–7 production processes

Drafting process

Multimodal (at least two modes delivered at the same time): up to 5 minutes, 8 A4 pages, or equivalent digital media

4.8.5 Instrument-specific standards

Demonstrate	Interpret	Select	Sequence	Evaluate	Adapt	Grade
The student response has the following characteristics:						
• proficient demonstration of construction drafting industry practices, skills and procedures when drafting a non-residential commercial structure	• insightful and justified interpretation of construction industry client briefs and technical information when drafting a non-residential commercial structure	• discerning selection of construction drafting industry practices and skills and procedures when drafting a non-residential commercial structure	• strategic sequencing of construction industry drafting production processes when drafting a non-residential commercial structure	• insightful and justified evaluation of construction industry drafting production skills, procedures and drawings for a non-residential commercial structure	• insightful and justified adaptation of construction industry drafting production plans, skills and procedures when drafting a non-residential commercial structure	A
• efficient demonstration of construction drafting industry practices, skills and procedures when drafting a non-residential commercial structure	• detailed and supported interpretation of construction industry client briefs and technical information when drafting a non-residential commercial structure	• thorough selection of construction drafting industry practices and skills and procedures when drafting a non-residential commercial structure	• considered sequencing of construction industry drafting production processes when drafting a non-residential commercial structure	• detailed and supported evaluation of construction industry drafting production skills, procedures and drawings for a non-residential commercial structure	• detailed and supported adaptation of construction industry drafting plans, skills and procedures when drafting a non-residential commercial structure	B
• demonstration of construction drafting industry practices, skills and procedures when drafting a non-residential commercial structure	• interpretation of construction industry client briefs and technical information when drafting a non-residential commercial structure	• selection of construction drafting industry practices and skills and procedures when drafting a non-residential commercial structure	• sequencing of construction industry drafting production processes when drafting a non-residential commercial structure	• evaluation of construction industry drafting production skills, procedures and drawings for a non-residential commercial structure	• adaptation of construction industry drafting plans, skills and procedures when drafting a non-residential commercial structure	C

Demonstrate	Interpret	Select	Sequence	Evaluate	Adapt	Grade
• rudimentary demonstration of construction drafting industry practices, skills and procedures when drafting a non-residential commercial structure.	• narrow and unsupported interpretation of construction industry client briefs and technical information when drafting a non-residential commercial structure.	• inconsistent selection of construction drafting industry practices and skills and procedures when drafting a non-residential commercial structure.	• inconsistent sequencing of construction industry drafting production processes when drafting a non-residential commercial structure.	• narrow and unsupported evaluation of construction industry drafting production skills, procedures and drawings for a non-residential commercial structure.	• narrow and unsupported adaptation of construction industry drafting plans, skills and procedures when drafting a non-residential commercial structure.	D
The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	E

4.9 Assessment E1: Practical demonstration — Engineering industry drafting

Students perform a practical demonstration when drafting engineering industry drawings and reflect on industry practices, production skills and procedures.

4.9.1 Assessment objectives

1. Demonstrate engineering drafting industry practices, and production skills and procedures.
2. Interpret engineering drafting client briefs and technical information.
3. Select engineering drafting industry practices, and production skills and procedures.
5. Evaluate engineering drafting production skills and procedures, and drawings.

4.9.2 Specifications

This task requires students to:

- interpret a client brief and technical information
- identify the skills required to draft engineering technical drawings
- selecting industry practices, production skills and procedures
- annotate sketches, photographs and/or video footage to capture decision-making
- demonstrate production skills and procedures used in 3–5 production processes
- reflect on the industry practices and production skills and procedures used to draft the drawings.

It is recommended that this task is designed so that students can develop a response in approximately 10 hours of class time.

Stimulus specifications

The teacher provides students with a client brief and technical information.

- The client brief must include the
  - client profile description, e.g. role, demographics, expectations
  - purpose for the drawings
  - required drawings for the client, e.g. development and pictorial representations.
- The technical information must include
  - the proposed sequence of drafting production processes
  - the required engineering industry drawing standards
  - a sketch of a fabricated sheet metal product with dimensions, e.g. metal toolbox.

4.9.3 Conditions

- Students can develop their responses in class time and their own time.
- This is an individual task
- Students have access to drafting equipment as required to complete the assessment.
- Drawings drafted for Assessment E1 must be separate from the product component of Assessment E2.

4.9.4 Response requirements

Practical demonstration of engineering industry drafting

Drawings: the drafting skills and procedures used in 3–5 production processes

Documentation

Multimodal (at least two modes delivered at the same time): up to 3 minutes, 6 A4 pages, or equivalent digital media

4.9.5 Instrument-specific standards

Demonstrate	Interpret	Select	Evaluate	Grade
The student response has the following characteristics:				
• proficient demonstration of engineering drafting industry practices, skills and procedures when drafting a fabricated sheet metal product	• insightful and justified interpretation of engineering drafting client briefs and technical information when drafting a fabricated sheet metal product	• discerning selection of engineering drafting industry practices and skills and procedures when drafting a fabricated sheet metal product	• insightful and justified evaluation of engineering drafting production skills, procedures and drawings of a fabricated sheet metal product	A
• efficient demonstration of engineering drafting industry practices, skills and procedures when drafting a fabricated sheet metal product	• detailed and supported interpretation of engineering drafting client briefs and technical information when drafting a fabricated sheet metal product	• thorough selection of engineering drafting industry practices and skills and procedures when drafting a fabricated sheet metal product	• detailed and supported evaluation of engineering drafting production skills, procedures and drawings of a fabricated sheet metal product	B
• demonstration of engineering drafting industry practices, skills and procedures when drafting a fabricated sheet metal product	• interpretation of engineering drafting client briefs and technical information when drafting a fabricated sheet metal product	• selection of engineering drafting industry practices and skills and procedures when drafting a fabricated sheet metal product	• evaluation of engineering drafting production skills, procedures and drawings of a fabricated sheet metal product	C
• rudimentary demonstration of engineering drafting industry practices, skills and procedures when drafting a fabricated sheet metal product.	• narrow and unsupported interpretation of engineering drafting client briefs and technical information when drafting a fabricated sheet metal product.	• inconsistent selection of engineering drafting industry practices and skills and procedures when drafting a fabricated sheet metal product.	• narrow and unsupported evaluation of engineering drafting production skills, procedures and drawings of a fabricated sheet metal product.	D
The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	E

4.10 Assessment E2: Project — Engineering industry drafting

Students draft engineering industry drawings and document the drafting process in response to a provided client brief and technical information.

4.10.1 Assessment objectives

1. Demonstrate engineering drafting industry practices, and production skills and procedures.
2. Interpret engineering drafting client briefs and technical information.
3. Select engineering drafting industry practices, and production skills and procedures.
4. Sequence engineering drafting production processes.
5. Evaluate engineering drafting production skills and procedures, and drawings.
6. Adapt engineering drafting plans, skills and procedures.

4.10.2 Specifications

This task requires students to:

- draft a set of engineering drawings for a product with fits and tolerances by
  - interpreting a client brief and technical information
  - selecting engineering drafting industry practices, and production skills and procedures
  - adapting drafting plans, production skills and procedures during drafting to meet the requirements in the client brief and technical information
- document the drafting process by
  - interpreting client briefs and technical information for the drafting of engineering drawings
  - deciding on the industry practices, and production skills and procedures required to draft the drawings
  - determining the sequence in which the drafting processes will be implemented
  - annotating sketches, photographs and/or video footage to capture decision-making
  - reflecting on the quality of the completed drawings, industry practices, and production skills and procedures used to draft the drawings.

It is recommended that this task is designed so that students can develop a response in approximately 20 hours of class time.

Stimulus specifications

The teacher provides students with a client brief and technical information.

- The client brief must include the
  - client profile description, e.g. role, demographics, expectations
  - purpose for the drawings
  - required drawings, e.g. the subset of engineering drawings required.
- The technical information must include
  - the required engineering industry drawing standards
  - a sketch of the engineered product with fits and tolerances to be drawn with dimensions, e.g. bench vice.

4.10.3 Conditions

- Students can develop their responses in class time and their own time.
- This is an individual task.
- Students have access to drafting equipment as required to complete the assessment.

4.10.4 Response requirements

Engineering drawings

Drawings: engineering industry drawings drafted using the skills and procedures in 5–7 production processes

Drafting process

Multimodal (at least two modes delivered at the same time): up to 5 minutes, 8 A4 pages, or equivalent digital media

4.10.5 Instrument-specific standards

Demonstrate	Interpret	Select	Sequence	Evaluate	Adapt	Grade
The student response has the following characteristics:						
• proficient demonstration of engineering drafting industry practices, skills and procedures when drafting an engineered product with fits and tolerances	• insightful and justified interpretation of engineering drafting client briefs and technical information when drafting an engineered product with fits and tolerances	• discerning selection of engineering drafting industry practices and skills and procedures when drafting an engineered product with fits and tolerances	• strategic sequencing of engineering industry drafting production processes when drafting an engineered product with fits and tolerances	• insightful and justified evaluation of engineering industry drafting production skills, procedures and drawings for an engineered product with fits and tolerances	• insightful and justified adaptation of engineering industry drafting production plans, skills and procedures when drafting an engineered product with fits and tolerances	A
• efficient demonstration of engineering drafting industry practices, skills and procedures when drafting an engineered product with fits and tolerances	• detailed and supported interpretation of engineering drafting client briefs and technical information when drafting an engineered product with fits and tolerances	• thorough selection of engineering drafting industry practices and skills and procedures when drafting an engineered product with fits and tolerances	• considered sequencing of engineering industry drafting production processes when drafting an engineered product with fits and tolerances	• detailed and supported evaluation of engineering industry drafting production skills, procedures and drawings for an engineered product with fits and tolerances	• detailed and supported adaptation of engineering industry drafting plans, skills and procedures when drafting an engineered product with fits and tolerances	B
• demonstration of engineering drafting industry practices, skills and procedures when drafting an engineered product with fits and tolerances	• interpretation of engineering drafting client briefs and technical information when drafting an engineered product with fits and tolerances	• selection of engineering drafting industry practices and skills and procedures when drafting an engineered product with fits and tolerances	• sequencing of engineering industry drafting production processes when drafting an engineered product with fits and tolerances	• evaluation of engineering industry drafting production skills, procedures and drawings for an engineered product with fits and tolerances	• adaptation of engineering industry drafting plans, skills and procedures when drafting an engineered product with fits and tolerances	C

Demonstrate	Interpret	Select	Sequence	Evaluate	Adapt	Grade
• rudimentary demonstration of engineering drafting industry practices, skills and procedures when drafting an engineered product with fits and tolerances.	• narrow and unsupported interpretation of engineering drafting client briefs and technical information when drafting an engineered product with fits and tolerances.	• inconsistent selection of engineering drafting industry practices and skills and procedures when drafting an engineered product with fits and tolerances.	• inconsistent sequencing of engineering industry drafting production processes when drafting an engineered product with fits and tolerances.	• narrow and unsupported evaluation of engineering industry drafting production skills, procedures and drawings for an engineered product with fits and tolerances.	• narrow and unsupported adaptation of engineering industry drafting plans, skills and procedures when drafting an engineered product with fits and tolerances.	D
The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	E

4.11 Assessment F1: Practical demonstration — Furnishing industry drafting

Students perform a practical demonstration when drafting furnishing industry drawings and reflect on industry practices and production skills and procedures.

4.11.1 Assessment objectives

1. Demonstrate furnishing drafting industry practices, production skills and procedures.
2. Interpret furnishing industry client briefs and technical information.
3. Select furnishing drafting industry practices, production skills and procedures.
5. Evaluate furnishing drafting production skills and procedures, and drawings.

4.11.2 Specifications

This task requires students to:

- interpret a client brief and technical information
- identify the skills required to draft furnishing technical drawings
- select industry practices, production skills and procedures
- demonstrate production skills and procedures used in 3–5 production processes
- reflect on the industry practices and production skills and procedures used to draft the drawings.

It is recommended that this task is designed so that students can develop a response in approximately 10 hours of class time.

Stimulus specifications

The teacher provides students with a client brief and technical information.

- The client brief must include the
  - client profile description, e.g. role, demographics, expectations
  - purpose of the drawings
  - required drawings by the client, e.g. orthographic views and a pictorial representation.
- The technical information must include the
  - proposed sequence of drafting production processes
  - required industry drawing standards
  - sketch of the mass-produced furniture to be drawn with dimensions, e.g. flat-pack cabinet.

4.11.3 Conditions

- Students can develop their responses in class time and their own time.
- This is an individual task.
- Students have access to drafting equipment as required to complete the assessment.
- Drawings drafted for Assessment F1 must be separate from the product component of Assessment F2.

4.11.4 Response requirements

Practical demonstration of furnishing industry drafting

Drawings: the drafting skills and procedures used in 3–5 production processes

Documentation

Multimodal (at least two modes delivered at the same time): up to 3 minutes, 6 A4 pages, or equivalent digital media

4.11.5 Instrument-specific standards

Demonstrate	Interpret	Select	Evaluate	Grade
The student response has the following characteristics:				
• proficient demonstration of furnishing drafting industry practices and processes when drafting a set of drawings for a mass-produced furniture product	• insightful and justified interpretation of furnishing drafting client briefs and technical information when drafting a set of drawings for a mass-produced furniture product	• discerning selection of furnishing drafting industry practices and skills and procedures when drafting a set of drawings for a mass-produced furniture product	• insightful and justified evaluation of furnishing drafting production skills, procedures and drawings for a mass-produced furniture product	A
• efficient demonstration of furnishing drafting industry practices and processes when drafting a set of drawings for a mass-produced furniture product	• detailed and supported interpretation of furnishing drafting client briefs and technical information when drafting a set of drawings for a mass-produced furniture product	• thorough selection of furnishing drafting industry practices and skills and procedures when drafting a set of drawings for a mass-produced furniture product	• detailed and supported evaluation of furnishing drafting production skills, procedures and drawings for a mass-produced furniture product	B
• demonstration of furnishing drafting industry practices and processes when drafting a set of drawings for a mass-produced furniture product	• interpretation of furnishing drafting client briefs and technical information when drafting a set of drawings for a mass-produced furniture product	• selection of furnishing drafting industry practices and skills and procedures when drafting a set of drawings for a mass-produced furniture product	• evaluation of furnishing drafting production skills, procedures and drawings for a mass-produced furniture product	C
• rudimentary demonstration of furnishing drafting industry practices and processes when drafting a set of drawings for a mass-produced furniture product.	• narrow and unsupported interpretation of furnishing drafting client briefs and technical information when drafting a set of drawings for a mass-produced furniture product.	• inconsistent selection of furnishing drafting industry practices and skills and procedures when drafting a set of drawings for a mass-produced furniture product.	• narrow and unsupported evaluation of furnishing drafting production skills, procedures and drawings for a mass-produced furniture product.	D
The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	E

4.12 Assessment F2: Project — Furnishing industry drafting

Students draft furnishing industry drawings and document the drafting process in response to a provided client brief and technical information.

4.12.1 Assessment objectives

1. Demonstrate furnishing drafting industry practices, and production skills and procedures.
2. Interpret furnishing drafting client briefs and technical information.
3. Select furnishing drafting industry practices, and production skills and procedures.
4. Sequence furnishing drafting production processes.
5. Evaluate furnishing drafting production skills and procedures, and drawings.
6. Adapt furnishing drafting plans, skills and procedures.

4.12.2 Specifications

This task requires students to:

- draft a set of furnishing drawings for a bespoke furnishing item by
  - interpreting a client brief and technical information
  - selecting furnishing industry practices, production skills and procedures
  - adapting drafting plans, production skills and procedures during drafting to meet the requirements in the client brief and technical information
- document the drafting production process by
  - interpreting client briefs and technical information for the drafting of furnishing drawings
  - deciding on the industry practices, and production skills and procedures required to draft the drawings
  - determining the sequence in which the drafting processes will be implemented
  - annotating sketches, photographs and/or video footage to capture decision-making
  - reflecting on the quality of the completed drawings, industry practices, and production skills and procedures used to draft the drawings.

It is recommended that this task is designed so that students can develop a response in approximately 20 hours of class time.

Stimulus specifications

The teacher provides students with a client brief and technical information.

- The client brief must include the
  - client profile description, e.g. role, demographics, expectations
  - purpose for the drawings
  - required drawings, e.g. orthographic views and pictorial representations.
- The technical information must include
  - the required industry drawing standards
  - a sketch of the bespoke furniture to be drawn with dimensions, e.g. chair.

4.12.3 Conditions

- Students can develop their responses in class time and their own time.
- This is an individual task.
- Students have access to drafting equipment as required to complete the assessment.

4.12.4 Response requirements

Furnishing drawings

Drawings: furnishing industry drawings drafted using the skills and procedures in 5–7 production processes

Drafting process

Multimodal (at least two modes delivered at the same time): up to 5 minutes, 8 A4 pages, or equivalent digital media

4.12.5 Instrument-specific standards

Demonstrate	Interpret	Select	Sequence	Evaluate	Adapt	Grade
The student response has the following characteristics:						
• proficient demonstration of furnishing drafting industry practices and processes when drafting a set of drawings for a bespoke furniture product	• insightful and justified interpretation of furnishing drafting client briefs and technical information when drafting a set of drawings for a bespoke furniture product	• discerning selection of furnishing drafting industry practices and drafting skills and procedures when drafting a set of drawings for a bespoke furniture product	• strategic sequencing of furnishing industry drafting production processes when drafting a set of drawings for a bespoke furniture product	• insightful and justified evaluation of furnishing industry drafting production skills, procedures and drawings for a bespoke furniture product	• insightful and justified adaptation of furnishing industry drafting production plans, skills, procedures when drafting drawings for a bespoke furniture product	A
• efficient demonstration of furnishing drafting industry practices and processes when drafting a set of drawings for a bespoke furniture product	• detailed and supported interpretation of furnishing drafting client briefs and technical information when drafting a set of drawings for a bespoke furniture product	• thorough selection of furnishing drafting industry practices and drafting skills and procedures when drafting a set of drawings for a bespoke furniture product	• considered sequencing furnishing industry drafting production processes when drafting a set of drawings for a bespoke furniture product	• detailed and supported evaluation of furnishing industry drafting production skills, procedures and drawings for a bespoke furniture product	• detailed and supported adaptation of furnishing industry drafting plans, skills, procedures when drafting drawings for a bespoke furniture product	B
• demonstration of furnishing drafting industry practices and processes when drafting a set of drawings for a bespoke furniture product	• interpretation of furnishing drafting client briefs and technical information when drafting a set of drawings for a bespoke furniture product	• selection of furnishing drafting industry practices and drafting skills and procedures when drafting a set of drawings for a bespoke furniture product	• sequencing furnishing industry drafting production processes when drafting a set of drawings for a bespoke furniture product	• evaluation of furnishing industry drafting production skills, procedures and drawings for a bespoke furniture product	• adaptation of furnishing industry drafting plans, skills, procedures when drafting drawings for a bespoke furniture product	C

Demonstrate	Interpret	Select	Sequence	Evaluate	Adapt	Grade
• rudimentary demonstration of furnishing drafting industry practices and processes when drafting a set of drawings for a bespoke furniture product.	• narrow and unsupported interpretation of furnishing drafting client briefs and technical information when drafting a set of drawings for a bespoke furniture product.	• inconsistent selection of furnishing drafting industry practices and drafting skills and procedures when drafting a set of drawings for a bespoke furniture product.	• inconsistent sequencing furnishing industry drafting production processes when drafting a set of drawings for a bespoke furniture product.	• narrow and unsupported evaluation of furnishing industry drafting production skills, procedures and drawings for a bespoke furniture product.	• narrow and unsupported adaptation of furnishing industry drafting plans, skills, procedures when drafting drawings for a bespoke furniture product.	D
The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	The student response does not match any of the descriptors above.	E

5 Glossary

The syllabus glossary is available at www.qcaa.qld.edu.au/downloads/senior-qce/common/snr_glossary_cognitive_verbs.pdf.

6 References

Marzano, RJ & Kendall, JS 2007, *The New Taxonomy of Educational Objectives*, 2nd edition, Corwin Press, USA.

——2008, Designing and Assessing Educational Objectives: Applying the new taxonomy, Corwin Press, USA.

7 Version history

Version	Date of change	Update
1.1	August 2023	Released for implementation with minor updates

ISBN
Electronic version: 978-1-74378-266-8

Queensland Curriculum & Assessment Authority
PO Box 307 Spring Hill QLD 4004 Australia

Phone: (07) 3864 0299
Email: office@qcaa.qld.edu.au
Website: www.qcaa.qld.edu.au