Industrial Technology Skills 2024 v1.2

Applied senior syllabus

January 2024





ISBN

Electronic version: 978-1-74378-276-7



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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.

Course overview

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 associated with traditional and contemporary tools and materials used by Australian manufacturing industries to produce products. The manufacturing industry transforms raw materials into products wanted by society. This adds value for both enterprises and consumers. Australia has strong manufacturing industries that continue to provide employment opportunities.

Industrial Technology Skills includes the study of industry practices and production processes through students' application in and through trade learning contexts in a range of industrial sector industries, including building and construction, engineering and furnishing. Industry practices are used by industrial sector enterprises to manage the manufacture of products from raw materials. Production processes combine the production skills and procedures required to produce products. Students engage in applied learning to demonstrate knowledge and skills of the core learning in units that meet local needs, available resources and teacher expertise. Through both individual and collaborative learning experiences, students learn to meet customer expectations of product quality at a specific price and time.

Applied learning supports students' development of transferable 21st century, literacy and numeracy skills relevant to a variety of industries. Students learn to interpret drawings and technical information, select and demonstrate safe practical production processes using hand/power tools, machinery and equipment, communicate using oral, written and graphical modes, organise, calculate, plan, evaluate and adapt production processes and the products they produce. The majority of learning is done through manufacturing tasks that relate to business and industry. Students work with each other to solve problems and complete practical work.

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 construction, drawing and manufacturing tasks. These relate to enterprises, workplace health and safety, personal and interpersonal skills, product quality, drawings and technical information, tools and materials.

2. Interpret drawings and technical information.

Students use knowledge of industry practices and production processes to draw meaning from elements and critical features of drawings and technical information. They draw meaning through mathematical calculations, industry conventions, standards and task-specific information, such as schedules, data tables and operating procedures.

3. Select practices, skills and procedures.

Students choose knowledge and skills to complete industry-specific construction, drawing and manufacturing tasks. Knowledge and skills relate to enterprises, workplace health and safety, personal and interpersonal skills, product quality, client briefs, drawings and technical information, tools and materials.

4. Sequence processes.

Students use knowledge and understanding of industry practices, including safety concepts and principles, waste minimisation, quality expectations, teamwork and regulations. They decide on the combination and order of production processes.

5. Evaluate skills and procedures, and products.

Students determine the efficiency and effectiveness of production skills and procedures in relation to industry practices and specific construction, drawing and manufacturing task requirements. They assess the strengths, implications and limitations of products, using client briefs, drawings, technical information and expectations of quality.

6. Adapt plans, skills and procedures.

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

Designing a course of study in Industrial Technology 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.

Course structure

Industrial Technology 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.

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.

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.

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.

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.

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.

Additional subject-specific information

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

Selecting units in Industrial Technology Skills

The Industrial Technology Skills syllabus contains units from the four industrial sector Applied senior syllabuses:

- Building & Construction Skills
- Engineering Skills
- Furnishing Skills
- Industrial Graphics Skills.

When selecting units to design a course of study in Industrial Technology Skills, the units must:

- be drawn from at least two industrial sector syllabuses and include no more than two units from each
- not be offered at the school in any other Applied industrial sector syllabus.

The four industrial sector Applied senior syllabuses are available at www.qcaa.qld.edu.au/senior/senior-subjects.

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.

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.

Reporting standards

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

Α

The student shows proficient demonstration of industry practices, and production skills and procedures when constructing, drafting or manufacturing structures, drawings or products. They demonstrate insightful and justified interpretation of client briefs, drawings and technical information. The student discerningly selects industry practices, and production skills and procedures. When constructing, drafting or manufacturing they strategically sequence production processes. They provide insightful and justified evaluations of production skills, procedures and structures, drawings or products. The student's adaptation of production plans, skills and procedures is insightful and justified when constructing, drafting or manufacturing structures, drawings or products.

В

The student shows efficient demonstration of industry practices, and production skills and procedures when constructing, drafting or manufacturing structures, drawings or products. They demonstrate detailed and supported interpretation of client briefs, drawings and technical information. The student thoroughly selects industry practices, and production skills and procedures. When constructing, drafting or manufacturing they consider how to sequence production processes. They provide detailed and supported evaluations of production skills, procedures and structures, drawings or products. The student's adaptation of production plans, skills and procedures is detailed and supported when constructing, drafting or manufacturing structures, drawings or products.

С

The student shows demonstration of industry practices, and production skills and procedures when constructing, drafting or manufacturing structures, drawings or products. They demonstrate interpretation of client briefs, drawings and technical information. The student selects industry practices, and production skills and procedures. When constructing, drafting or manufacturing they sequence production processes. They provide evaluations of production skills, procedures and structures, drawings or products. The student adapts production plans, skills and procedures when constructing, drafting or manufacturing structures, drawings or products.

D

The student shows rudimentary demonstration of practices, and production skills and procedures when constructing, drafting or manufacturing structures, drawings or products. They demonstrate narrow and unsupported interpretation of drawings and technical information. The student inconsistently selects industry practices, and production skills and procedures. When constructing, drafting or manufacturing they inconsistently sequence production skills or procedures. They provide narrow and unsupported evaluations of production skills, procedures and structures, drawings or products. The student's adaptation of skills or procedures is narrow and unsupported when constructing, drafting or manufacturing incomplete structures, drawings or products.

Ε

The student shows incorrect demonstration of practices, and production skills and procedures when constructing, drafting or manufacturing structures, drawings or products. They demonstrate superficial and unsubstantiated interpretation of client briefs, drawings and technical information. The student incorrectly selects industry practices, and production skills and procedures. When constructing, drafting or manufacturing they incorrectly sequence production skills or procedures. They provide statements about production skills, procedures and structures, drawings or products. The student changes skills or procedures when constructing, drafting or manufacturing aspects of structures, drawings or products.

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).

Unit options

Unit option A: Site preparation and foundations (Building & Construction Skills)

Unit option B: Framing and cladding (Building & Construction Skills)

Unit option C: Fixing and finishing (Building & Construction Skills)

Unit option D: Construction in the domestic building industry (Building & Construction Skills)

Unit option E: Construction in the commercial building industry (Building & Construction Skills)

Unit option F: Construction in the civil construction industry (Building & Construction Skills)

Unit option G: Fitting and machining (Engineering Skills)

Unit option H: Welding and fabrication (Engineering Skills)

Unit option I: Sheet metal working (Engineering Skills)

Unit option J: Production in the structural engineering industry (Engineering Skills)

Unit option K: Production in the transport engineering industry (Engineering Skills)

Unit option L: Production in the manufacturing engineering industry (Engineering Skills)

Unit option M: Furniture-making (Furnishing Skills)

Unit option N: Cabinet-making (Furnishing Skills)

Unit option O: Interior furnishing (Furnishing Skills)

Unit option P: Production in the domestic furniture industry (Furnishing Skills)

Unit option Q: Production in the commercial furniture industry (Furnishing Skills)

Unit option R: Production in the bespoke furniture industry (Furnishing Skills)

Unit option S: Drafting for residential building (Industrial Graphics Skills)

Unit option T: Computer-aided manufacturing drafting (Industrial Graphics Skills)

Unit option U: Computer-aided drafting — modelling (Industrial Graphics Skills)

Unit option V: Graphics for the construction industry (Industrial Graphics Skills)

Unit option W: Graphics for the engineering industry (Industrial Graphics Skills)

Unit option X: Graphics for the furnishing industry (Industrial Graphics Skills)

Find unit information and subject matter in the Industrial Graphics Skills 2024 Applied senior syllabus, available on the QCAA website.

Assessment

Assessment A1: Practical demonstration — Site preparation and foundations (Building & Construction Skills)

Assessment A2: Project — Site preparation and foundations (Building & Construction Skills)

Assessment B1: Practical demonstration — Framing and cladding (Building & Construction Skills)

Assessment B2: Project — Framing and cladding (Building & Construction Skills)

Assessment C1: Practical demonstration — Fixing and finishing (Building & Construction Skills)

Assessment C2: Project — Fixing and finishing (Building & Construction Skills)

Find assessment information in the Building & Construction Skills 2024 Applied senior syllabus, available on the QCAA website.

Skills)

Assessment D1: Practical demonstration — Domestic building (Building & Construction Skills)

Assessment D2: Project — Domestic building (Building & Construction Skills)

Assessment E1: Practical demonstration — Commercial building (Building & Construction Skills)

Assessment E2: Project — Commercial building (Building & Construction Skills)

Assessment F1: Practical demonstration — Civil construction (Building & Construction Skills)

Assessment F2: Project — Civil construction (Building & Construction Skills)

Assessment G1: Practical demonstration — Fitting and machining (Engineering Skills)

Assessment G2: Project — Fitting and machining (Engineering Skills)

Assessment H1: Practical demonstration — Welding and fabrication (Engineering Skills)

Assessment H2: Project — Welding and fabrication (Engineering Skills)

Assessment I1: Practical demonstration — Sheet metal working (Engineering Skills)

Assessment I2: Project — Sheet metal working (Engineering Skills)

Assessment J1: Practical demonstration — Structural engineering (Engineering Skills)

Assessment J2: Project — Structural engineering (Engineering Skills)

Assessment K1: Practical demonstration — Transport engineering (Engineering Skills)

Assessment K2: Project — Transport engineering (Engineering Skills)

Assessment L1: Practical demonstration — Manufacturing engineering (Engineering Skills)

Assessment L2: Project — Manufacturing engineering (Engineering Skills)

Assessment M1: Practical demonstration — Furniture-making (Furnishing Skills)

Assessment M2: Project — Furniture-making (Furnishing Skills)

Assessment N1: Practical demonstration — Cabinet-making (Furnishing Skills)

Assessment N2: Project — Cabinet-making (Furnishing Skills)

Assessment O1: Practical demonstration — Interior furnishing (Furnishing Skills)

Assessment O2: Project — Interior furnishing (Furnishing Skills)

Assessment P1: Practical demonstration — Domestic furniture (Furnishing Skills)

Assessment P2: Project — Domestic furniture (Furnishing Skills)

Assessment Q1: Practical demonstration — Commercial furniture (Furnishing Skills)

Assessment Q2: Project — Commercial furniture (Furnishing Skills)

Assessment R1: Practical demonstration — Bespoke furniture (Furnishing Skills)

Assessment R2: Project — Bespoke furniture (Furnishing Skills)

Assessment S1: Practical demonstration — Residential building drafting (Industrial Graphics Skills)

Assessment S2: Project — Residential building drafting (Industrial Graphics Skills)

Assessment T1: Practical demonstration — Computer-aided manufacturing drafting (Industrial Graphics Skills)

Assessment T2: Project — Computer-aided manufacturing drafting (Industrial Graphics Skills)

Assessment U1: Practical demonstration — Computer-aided drafting (Industrial Graphics Skills)

Assessment U2: Project — Computer-aided drafting (Industrial Graphics Skills)

Assessment V1: Practical demonstration — Construction industry drafting (Industrial Graphics Skills)

Assessment V2: Project — Construction industry drafting (Industrial Graphics Skills)

Find assessment information in the Industrial Graphics Skills 2024 Applied senior syllabus, available on the QCAA website.

(Industrial Graphics Skills)

Assessment W1: Practical demonstration — Engineering industry drafting (Industrial Graphics Skills)

Assessment W2: Project — Engineering industry drafting (Industrial Graphics Skills)

Assessment X1: Practical demonstration — Furnishing industry drafting (Industrial Graphics Skills)

Assessment X2: Project — Furnishing industry drafting (Industrial Graphics Skills)

Find assessment information in the Industrial Graphics Skills 2024 Applied senior syllabus, available on the QCAA website.

(Industrial Graphics Skills)

Glossary

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

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.

Version history

Version	Date of change	Information
1.0	January 2023	Released for familiarisation and planning
1.1	August 2023	Released for implementation with minor updates
1.2	January 2024	Reporting standards – inclusion of 'structures, drawings or' in all achievement standards

(Industrial Graphics Skills)