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1 Rationale

Information technology (IT) is an area characterised by frequent and rapid change. It presents particular challenges for Australian society, especially the need to respond to emerging technologies and trends. Information technology involves the use of technologies by which people manipulate and share information in its various forms — text, graphics, sound and video — and the range of devices used to perform these functions.

The subject Information Technology Systems (ITS) is a practical discipline which prepares students to meet these rapid changes and to respond to emerging technologies and trends. It provides students with the knowledge and skills used in the systems supporting IT. These systems range from those supporting the development of information, such as documents or websites, to those supporting technology, such as computers or networks.

Information Technology Systems develops a fluency in information technology that is more comprehensive than information technology literacy alone. The term “IT literacy” suggests the acquisition of a repertoire of skills and the capability to use today's technology. This is generally developed in the P–10 years of schooling. ITS goes further to develop the notion of IT fluency — the ability to adapt to changes in technology and to independently learn and use new technologies as they arise throughout one's lifetime. Fluency with IT allows students to focus their studies through complex problem solving and detailed projects which emphasise management skills, the ability to work individually and in teams, effective communication, the development of productive relationships with clients, and consideration of the social and ethical issues related to their studies.

Information Technology Systems should prove especially relevant to students in the way it prepares them to cope with, and harness to their advantage, the rapid changes and significant opportunities associated with IT, now and into their future. This subject may lead to employment in such areas as IT support, graphic and multimedia manipulation, or tertiary study in the fields of multimedia design, games design, website design and animation.
2 Dimensions and objectives

The dimensions are the salient properties or characteristics of distinctive learning for this subject. The dimensions are described through their objectives and it is these that schools are required to teach and that students should have the opportunity to learn. The objectives describe what students should be able to do by the end of the course of study.

Progress in a particular dimension may depend on the qualities and skills developed in other dimensions. Learning through each of the dimensions must be developed in increasing complexity and sophistication over a four-semester course of study.

Schools must assess how well students have achieved the objectives. The standards have a direct relationship with the objectives, and are described in the same dimensions as the objectives.

The dimensions for a course of study in this subject are:

- Dimension 1: Knowledge and communication
- Dimension 2: Design and development
- Dimension 3: Implementation and evaluation.

2.1 Dimension 1: Knowledge and communication

The dimension Knowledge and communication refers to comprehending, understanding and communicating the terms, concepts, principles and design processes associated with information technology.

This dimension involves demonstrating IT knowledge through defining, explaining and using IT terms, concepts and principles. Explaining involves communicating a meaning with clarity, precision and completeness and is enhanced by the use of examples.

Information technology terms, concepts, principles and design processes are communicated and documented using appropriate modes, genres and language conventions. Mode refers to a system of communication chosen as the way to transmit a message (e.g. written, spoken/signed, visual or auditory). Genre refers to accepted categories of texts. Genres have features and patterns that relate to context, purpose and audience. Language conventions refers to accepted language practices developed over time and generally used and understood, for example use of spelling, punctuation and grammar.

2.1.1 Objectives

By the conclusion of the course of study, students should:

- define, explain and use IT terms, concepts and principles
- communicate concepts, principles and design processes using mode, genre and language conventions.

2.2 Dimension 2: Design and development

The dimension Design and development involves determining the intended purpose, the needs of the client and proposing and testing possible solutions. It requires research, analysis, synthesis and ongoing testing related to the process of design and development and the associated documentation.

Analysis refers to dissecting client needs and scenarios to ascertain and examine constituent parts and/or their relationships.
Synthesis refers to assembling the results of the analysis into a coherent, unique and/or complex system or solution.

Solutions to the design challenge are enhanced by progressive development and testing of components through the design process to refine solutions.

2.2.1 Objectives

By the conclusion of the course of study, students should:

- analyse client needs, purpose and scenarios to inform the design plan
- synthesise information to design solutions
- develop and test components to refine solutions.

2.3 Dimension 3: Implementation and evaluation

The dimension *Implementation and evaluation* focuses on the quality of the solution. The quality and effectiveness of the solution is to be evaluated against the client needs and the defined criteria formulated during the design and development phase.

This dimension examines the use and refinement of the developer’s skills throughout the design and development phase to present a solution.

It involves reflection on actions taken, design and development contexts, inputs, processes and products applied through all stages of planning and development. Evaluation refers to assigning merit according to criteria.

2.3.1 Objectives

By the conclusion of the course of study, students should:

- use technical skills and resources to present a solution
- evaluate the solution against the defined criteria using the contexts, inputs, processes and products (CIPP) model of evaluation.
3 Course organisation

3.1 Course of study overview

A course of study in Information Technology Systems requires:

- a contextual approach to learning and assessment (see Section 3.1.1)
- the five elements, detailed in Section 3.1.2, to be **blended** into the learning and assessment program across each year.
  - The elements of *Theory and techniques* and *Problem-solving process* must be covered in each unit of work (see Section 3.1.3).

**Diagram 1: Example course of study**

**Elements**
- Theory and techniques
- Problem-solving process

<table>
<thead>
<tr>
<th>Elements</th>
<th>Elements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theory and techniques</td>
<td>Project management</td>
</tr>
<tr>
<td>Problem-solving process</td>
<td>Client relationships</td>
</tr>
<tr>
<td>Social and ethical issues</td>
<td></td>
</tr>
</tbody>
</table>

**Year 11 course of study**

- Context
- Additional units of work

**Year 12 course of study**

- Context
- Additional units of work
3.1.1 Contexts

Over a course of study, schools may select one or a number of contexts as a focus for learning and assessment.

Contexts include, but are not limited to, the following:

- Animation
- Game design
- Graphic design
- Interactive media
- Mobile technology
- Multimedia
- Networking
- Video production
- Web design.

Other contexts chosen must have an IT focus and must have the potential to deliver any of the elements.

3.1.2 Elements

The course must cover a blend of the following five elements:

- Theory and techniques
- Problem-solving process
- Project management
- Client relationships
- Social and ethical issues.

Theory and techniques

Relevant Theory and techniques subject matter must be covered in each unit of work.

The possible subject matter includes, but is not limited to:

- advanced features and functions of software, resources and tools
- hardware and software specifications and functionality, including broad knowledge of input, output, processing and storage devices
- backup, disaster recovery and security procedures
- current trends and developments in IT
- documentation, e.g. user, internal, procedural and training manuals
- use of a programming language, e.g. HTML, JavaScript, Lingo, ActionScript, Visual Basic, network configuration files
- human computer interfaces that include usability and accessibility
- file types, file management and naming conventions
- stand-alone, networked and cloud-based operating systems, applications and storage
- principles and theories applicable to the chosen context/s, for example:
- **Animation**: timeline, keyframes, tweening, 2-D or 3-D modelling, motion caption, layers, libraries, editing tools, storyboarding
- **Game design**: game theory, scenes, storyboarding, interface, navigation
- **Graphic design**: CARP design principles, typographical principles and techniques
- **Interactive media**: scripting, interface design, storyboarding
- **Mobile technology**: applications, interface design, location awareness, social networking, augmented reality
- **Multimedia**: integration of multiple forms of media working together to create an effective workflow
- **Networking**: protocols, hardware, cabling, routing
- **Video production**: storyboarding, filming techniques, post-production techniques
- **Web design**: storyboarding, wire frame, CSS, HTML.

**Problem-solving process**

The *problem-solving process* must be incorporated into each unit of work.

The design–develop–evaluate cycle that underpins problem-solving processes must be used as a method of inquiry. The skills of analysis, synthesis and evaluation are to be demonstrated using problem-solving methods appropriate to the task (see Table 1).

**Table 1: Project development model**

<table>
<thead>
<tr>
<th>Phase</th>
<th>Brief description of what the phase encompasses</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Design</strong></td>
<td></td>
</tr>
<tr>
<td>Identification</td>
<td>Clarification of the issue being examined involving clear statements of problem identification, rationale and aims.</td>
</tr>
<tr>
<td>Specification</td>
<td>Description of the type of outcome required, including the nature of inputs and outputs, hardware and software requirements and audience, as appropriate.</td>
</tr>
<tr>
<td>Design</td>
<td>Planning the details of the solution using a recognised methodology.</td>
</tr>
<tr>
<td><strong>Develop</strong></td>
<td></td>
</tr>
<tr>
<td>Application</td>
<td>Applying the design with the chosen software.</td>
</tr>
<tr>
<td>Testing</td>
<td>Testing for accuracy by checking for logical and syntactical errors.</td>
</tr>
<tr>
<td><strong>Evaluate</strong></td>
<td></td>
</tr>
<tr>
<td>Evaluation</td>
<td>Evaluate the contexts, inputs, processes and products (CIPP).</td>
</tr>
</tbody>
</table>

Evaluating the contexts, inputs, processes and products (CIPP), as detailed in Table 1, refers to:

- **Contexts** — factors such as background, environment, circumstances, and real or simulated clients. These influence planning, design and development.
- **Inputs** — resources such as equipment, software, people, and data. These are needed for planning, design and development and their impact must be considered.
- **Processes** — the identifiable phases undertaken in design and development. Processes could include the phases of the project development model (see Table 1), as well as problem resolution and conflict resolution.
- **Products, services or solutions** — the outcomes of a task. Product evaluation involves determining how well the finished product matches pre-established specifications, as well as making recommendations for future actions.
**Project management**

Students need to consider the management of projects to ensure that they are completed satisfactorily.

This includes knowledge and application of:

- quality-assurance practices
- project management considerations including scope, time, cost, quality, risk, human resources, physical resources and other constraints
- project planning, e.g. preparation of a project development plan
- team dynamics, including features of an effective team, team structure, roles and responsibilities.

**Client relationships**

Students need to develop a client focus for this course of study. This includes knowledge and application of:

- client needs analysis
- negotiation skills
- questioning and active listening techniques for conveying and clarifying information
- techniques for obtaining and responding to client evaluation and feedback
- user and technical documentation
- developing communication strategies that meet client expectations
- contractual obligations between client and developer.

**Social and ethical issues**

Students need to investigate and consider the social and ethical implications of new technologies when making decisions about adopting them. This includes knowledge and application of:

- system security issues
- digital rights management and copyright
- intellectual property
- safety and privacy
- piracy issues
- accessibility issues
- equity issues
- historical and current trends in IT
- globalisation
- disaster recovery planning.

### 3.1.3 Units of work

A unit of work outlines the subject matter, learning experiences and assessment that will be effective in implementing the objectives of the syllabus. A unit of work consists of:

- selected context
- relevant subject matter and aspects from the elements of *Theory and techniques* and *Problem-solving process*
- relevant subject matter from any other identified element, i.e. *Project management, Client relationships, Social and ethical issues.*
3.1.4 Time allocation

The minimum number of hours of timetabled school time, including assessment, for a course of study developed from this syllabus is 55 hours per semester. A course of study will usually be completed over four semesters (220 hours).

3.2 Advice, guidelines and resources

The following advice, guidelines and resources support the implementation of the syllabus, and unless otherwise stated, are available from the Information Technology Systems subject page of the QSA website <www.qsa.qld.edu.au/18153.html>.

Aboriginal and Torres Strait Islander perspectives

The Queensland Studies Authority (QSA) recognises Aboriginal and Torres Strait Islander peoples, their traditions, histories and experiences from before European settlement and colonisation through to the present time. To strengthen students’ appreciation and understanding of the first peoples of the land, opportunities exist in the syllabus to encourage engagement with Aboriginal and Torres Strait Islander:

- frameworks of knowledge and ways of learning
- contexts in which Aboriginal and Torres Strait Islander peoples live
- contributions to Australian society and cultures.

Subject-specific resources are available on the Information Technology Systems subject page. In addition, guidelines about Aboriginal and Torres Strait Islander perspectives and resources for teaching can be accessed on the QSA website at <www.qsa.qld.edu.au/577.html>.

Composite classes

This syllabus enables teachers to develop a course that caters for a variety of ways to organise learning, such as combined Years 11 and 12 classes, combined campuses, or modes of delivery involving periods of student-managed study. This resource provides guidelines about composite classes.

Educational equity

Equity means fair treatment of all. In developing work programs from this syllabus, schools need to provide opportunities for all students to demonstrate what they know and what they can do. All students, therefore, should have equitable access to educational programs and human and material resources.

In addition to the subject-specific resources available on the Information Technology Systems subject page, guidelines about educational equity and resources for devising an inclusive work program can be accessed on the QSA website at <www.qsa.qld.edu.au/10188.html>.

General capabilities

Students require a number of skills and dispositions in preparation for life and work. These include “planning and organising, the ability to think flexibly, to communicate well and to work in teams … the capacity to think creatively, innovate, solve problems and engage with new disciplines”, according to the Melbourne Declaration on Educational Goals for Young Australians.

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1 The Queensland Government has a vision that Aboriginal and Torres Strait Islander Queenslanders have their cultures affirmed, heritage sustained and the same prospects for health, prosperity and quality of life as other Queenslanders. The QSA is committed to helping achieve this vision and encourages teachers to include Aboriginal and Torres Strait Islander perspectives in the curriculum.
The Australian Curriculum identified seven general capabilities for their entitlement curriculum. These are:

- Literacy
- Numeracy
- Information and communication technology (ICT) competence
- Critical and creative thinking
- Personal and social competence
- Ethical behaviour
- Intercultural understanding.

It is the responsibility of teachers to continue to develop the general capabilities established in the Prep to Year 10 Learning areas that are appropriate to Information Technology Systems.

**Learning experiences and sample resources**

This resource provides guidelines for learning experiences and sample resources, which may include unit/s of work.

**Reference materials**

This resource provides links to reference materials, text and reference books, websites, newspaper reports, periodicals, electronic media and learning technology, and organisations and community resources for the subject.

**Work program requirements**

A work program is the school’s plan of how the course of study will be delivered and assessed, based on the school’s interpretation of the syllabus. It allows for the special characteristics of the individual school and its students. Work program requirements, checklists and samples are available on the Information Technology Systems subject page of the QSA website. Instructions for online submission of work programs are available from <https://www.qsa.qld.edu.au/wponline/login.qsa>.

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4 Assessment

Assessment is an integral part of the teaching and learning process. For Years 11 and 12 it is the purposeful, systematic and ongoing collection of information about student learning outlined in the senior syllabuses.

In Queensland, assessment is standards based. The standards for each subject are described in dimensions, which identify the valued features of the subject about which evidence of student learning is collected and assessed. The standards describe the characteristics of student work.

The major purposes of assessment in senior Authority subjects are to:

- promote, assist and improve learning
- inform programs of teaching and learning
- advise students about their own progress to help them achieve as well as they are able
- give information to parents and teachers about the progress and achievements of individual students to help them achieve as well as they are able
- provide comparable levels of achievement in each Authority subject which may contribute credit towards a Queensland Certificate of Education
- provide base data for tertiary entrance purposes
- provide information about how well groups of students are achieving for school authorities and the State Education and Training Minister.

4.1 Principles of exit assessment

All the principles of exit assessment must be used when planning an assessment program and must be applied when making decisions about exit levels of achievement.

A standards-based assessment program for the four-semester course of study requires application of the following interdependent principles:

- Information is gathered through a process of continuous assessment, i.e. continuous assessment.
- Balance of assessment is a balance over the course of study and not necessarily a balance over a semester or between semesters, i.e. balance.
- Exit achievement levels are devised from student achievement in all areas identified in the syllabus as being mandatory, i.e. mandatory aspects of the syllabus.
- Assessment of a student’s achievement is in the significant aspects of the course of study identified in the syllabus and the school’s work program, i.e. significant aspects of the course of study.
- Selective updating of a student’s profile of achievement is undertaken over the course of study, i.e. selective updating.
- Exit assessment is devised to provide the fullest and latest information on a student’s achievement in the course of study, i.e. fullest and latest.

While most students will exit a course of study after four semesters, some will exit after one, two or three semesters.

Continuous assessment

Judgments about student achievement made at exit from a course of study must be based on an assessment program of continuous assessment.
Continuous assessment involves gathering information on student achievement using assessment instruments administered at suitable intervals over the developmental four-semester course of study.

In continuous assessment, all assessment instruments have a formative purpose — to improve teaching and student learning and achievement.

When students exit the course of study, teachers make a summative judgment about their levels of achievement in accordance with the standards matrix.

The process of continuous assessment provides the framework in which the other five principles of exit assessment operate: balance, mandatory aspects of the syllabus, significant aspects of the course of study, selective updating, and fullest and latest information.

**Balance**

Judgments about student achievement made at exit from a course of study must be based on a balance of assessments over the course of study.

Balance of assessments is a balance over the course of study and not a balance within a semester or between semesters.

Balance of assessments means judgments about students’ achievements of all the dimensions are made a number of times using a variety of assessment techniques and a range of assessment conditions over the developmental four-semester course of study.

See also Section 4.6 Requirements for verification folio.

**Mandatory aspects of the syllabus**

Judgments about student achievement made at exit from a course of study must be based on mandatory aspects of the syllabus.

The mandatory aspects are:

- the objectives of the dimensions *Knowledge and communication*, *Design and development* and *Implementation and evaluation*
- the elements of *Theory and techniques* and *Problem-solving process* (detailed in Section 3.1.2).

To ensure that the judgment of student achievement at exit from a four-semester course of study is based on the mandatory aspects, the exit standards for the dimensions stated in the standards matrix (refer to Section 4.8.2) must be used.

**Significant aspects of the course of study**

Judgments about student achievement made at exit from a course of study must be based on significant aspects of the course of study.

Significant aspects are those areas described in the school’s work program that have been selected from the choices permitted by the syllabus to meet local needs.

The significant aspects must be consistent with the objectives of the syllabus and complement the developmental nature of learning in the course of study over four semesters.

**Selective updating**

Judgments about student achievement made at exit from a course of study must be selectively updated throughout the course of study.

Selective updating is related to the developmental nature of the course of study and works in conjunction with the principle of fullest and latest information.
As subject matter is treated at increasing levels of complexity, assessment information gathered at earlier stages of the course of study may no longer be representative of student achievement. Therefore, the information should be selectively and continually updated (not averaged) to accurately represent student achievement.

Schools may apply the principle of selective updating to the whole subject-group or to individual students.

**Whole subject-group**

A school develops an assessment program so that, in accordance with the developmental nature of the course of study, later assessment information based on the same groups of objectives replaces earlier assessment information.

**Individual students**

A school determines the assessment folio for verification or exit (post-verification). The student’s assessment folio must be representative of the student’s achievements over the course of study. The assessment folio does not have to be the same for all students; however, the folio must conform to the syllabus requirements and the school’s approved work program.

Selective updating must not involve students reworking and resubmitting previously graded responses to assessment instruments.

**Fullest and latest information**

Judgments about student achievement made at exit from a course of study must be based on the fullest and latest information available.

- “Fullest” refers to information about student achievement gathered across the range of objectives.
- “Latest” refers to information about student achievement gathered from the most recent period in which achievement of the objectives is assessed.

As the assessment program is developmental, fullest and latest information will most likely come from Year 12 for those students who complete four semesters of the course of study.

The fullest and latest assessment data on mandatory and significant aspects of the course of study is recorded on a student profile.

### 4.2 Planning an assessment program

To achieve the purposes of assessment listed at the beginning of this section, schools must consider the following when planning a standards-based assessment program:

- dimensions and objectives (see Section 2)
- course organisation (see Section 3)
- principles of exit assessment (see Section 4.1)
- variety in assessment techniques over the four-semester course of study (see Section 4.5)
- conditions in which assessment instruments are undertaken (see Section 4.5)
- verification folio requirements, i.e. the range and mix of assessment instruments necessary to reach valid judgments of students’ standards of achievement (see Section 4.6)
- post-verification assessment (see Section 4.6.1)
- exit standards (see Section 4.7).

In keeping with the principle of continuous assessment, students should have opportunities to become familiar with the assessment techniques that will be used to make summative judgments.
Further information can be found on the Information Technology Systems subject page of the QSA website <www.qsa.qld.edu.au/18153.html>.

### 4.3 Special provisions

Guidance about the nature and appropriateness of special provisions for particular students may be found in the QSA’s *Policy on Special Provisions for School-based Assessments in Authority and Authority-registered Subjects* (2009), available from <www.qsa.qld.edu.au/2132.html>. This statement provides guidance on responsibilities, principles and strategies that schools may need to consider in their school settings.

To enable special provisions to be effective for students, it is important that schools plan and implement strategies in the early stages of an assessment program and not at the point of deciding levels of achievement. The special provisions might involve alternative teaching approaches, assessment plans and learning experiences.

### 4.4 Authentication of student work

It is essential that judgments of student achievement be made on accurate and genuine student assessment responses. Teachers should ensure that students’ work is their own, particularly where students have access to electronic resources or when they are preparing collaborative tasks.

*The A–Z of Senior Moderation* contains a section on authenticating student work <www.qsa.qld.edu.au/1426.html>. This provides information about various methods teachers can use to monitor that students’ work is their own. Particular methods outlined include:

- teachers seeing plans and drafts of student work
- student production and maintenance of documentation for the development of responses
- student acknowledgment of resources used.

Teachers must ensure students use consistent accepted conventions of in-text citation and referencing, where appropriate.


### 4.5 Assessment techniques

The techniques and associated conditions of assessment most suited to the judgment of student achievement in this subject are described in the following sections. The dimensions to which each technique is best suited are also indicated.

For each dimension, standards are described. Schools decide the instruments to be used for assessment. For each assessment instrument, schools develop instrument-specific standards from the syllabus standards descriptors for relevant dimensions (see Section 4.8.2 Standards matrix). These instrument-specific standards are used for making judgments about the quality of students’ responses. Students must be given instrument-specific standards for each assessment instrument.

Where students undertake assessment in a group or team, instruments must be designed so that teachers can validly assess the work of individual students and not apply a judgment of the group product and processes to all individuals.
4.5.1 Supervised written

**Purpose**
This technique assesses a range of cognition through written responses produced independently, under supervision and in a set timeframe to ensure authenticity.

**Description**
- A supervised assessment may include one or more items.
- Conditions must be explained on the assessment instrument.
- Items will be in response to questions or statements. Questions or statements are typically unseen. If seen, teachers must ensure the purpose of this technique is not compromised.
- Stimulus materials may also be used. Stimulus materials may be seen or unseen.
- Unseen questions, statements or stimulus materials should not be copied from information or texts that students have previously been exposed to or have directly used in class.

**Dimensions to be assessed**
Supervised written assessments are best used to determine student achievement in objectives from:
- **Knowledge and communication**
- **Design and development**
- **Implementation and evaluation**.

**Types of items that could be included**

*Extended written response*
- Items require sustained analysis, synthesis and evaluation to fully answer a problem.
- Students provide a response to a seen or unseen question or statement, and seen or unseen supplied sources/stimuli.
- The response could be an analytical exposition format/genre.

If an extended piece of writing is chosen, it is best if it is the only item, as this will better allow students to demonstrate the full range of standards.

*Short responses*
- Items may include response to stimulus activities that require:
  - explanations longer than one sentence
  - ideas maintained, developed and justified
  - full sentence responses, constructing a piece of prose that may have one or several paragraphs.
- Items may also include multiple-choice, single-word, true/false, or sentence answers. These types of questions are useful for assessing content knowledge and are difficult to construct if trying to elicit meaningful high-order cognitive responses.

*Practical response*
- Items may require students to construct, use, modify, interpret or analyse:
  - code or programming script
  - tables, diagrams or graphs
  - images, websites or print materials.
**Conditions clearly stated on the assessment**

<table>
<thead>
<tr>
<th>Year 11</th>
<th>Year 12</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Recommended time: <strong>1–1.5 hours.</strong>&lt;br&gt;• Perusal times may be added as required.&lt;br&gt;• Use of support materials or technologies, e.g. notes, other reference materials, calculators or computers, may be appropriate.&lt;br&gt;• Questions may be seen or unseen.&lt;br&gt;• Word lengths:&lt;br&gt;  - short responses: <strong>50–250 words</strong> (diagrams and workings not included in word count)&lt;br&gt;  - extended written response: <strong>400–600 words.</strong>&lt;br&gt;• If students use computers to respond to these assessments, schools must ensure that the purpose of this technique is maintained.</td>
<td>• Recommended time: <strong>1.5–2 hours.</strong>&lt;br&gt;• Perusal times may be added as required.&lt;br&gt;• Use of support materials or technologies, e.g. notes, other reference materials, calculators or computers, may be appropriate.&lt;br&gt;• Questions may be seen or unseen.&lt;br&gt;• Word lengths:&lt;br&gt;  - short responses: <strong>50–250 words</strong> (diagrams and workings not included in word count)&lt;br&gt;  - extended written response: <strong>600–800 words.</strong>&lt;br&gt;• If students use computers to respond to these assessments, schools must ensure that the purpose of this technique is maintained.</td>
</tr>
</tbody>
</table>

**Advice for teachers**

• Format the assessment to allow for ease of reading and responding.<br>• Consider the language needs of the students and avoid ambiguity.<br>• Ensure the questions allow the full range of standards to be demonstrated.<br>• Consider the instrument conditions in relation to the requirements of the question/stimulus.<br>• Outline any permitted material in the instrument conditions, e.g. one page of handwritten notes.<br>• Determine appropriate use of stimulus materials and student notes. Ensure stimulus materials are succinct enough to allow students to engage with them in the time provided; if they are lengthy, consider giving students access to them before the assessment.<br>• Provide students with learning experiences that support the types of items, including opportunities to respond to unseen tasks using appropriate communication strategies.<br>• Indicate on the assessment the dimensions and objectives that will be assessed and explain the instrument-specific standards.

**4.5.2 Extended response**

**Purpose**
This technique assesses the sustained application of higher-order cognition (analysis, synthesis and evaluation) to known and provided materials, stimuli and concepts.

**Description**
• The extended response to a situation requires analysis, synthesis and evaluation of data and information. The response may involve:<br>  - solving a problem<br>  - expressing and justifying a point of view<br>  - explaining and evaluating an issue<br>  - applying concepts or theories to a scenario.
• Research is not the focus of this technique.
• This assessment may occur over a period of time, in class, and possibly in students’ own time.

**Dimensions to be assessed**
Extended response assessments are best used to determine student achievement in objectives from:
• *Knowledge and communication*
• *Design and development*
• *Implementation and evaluation.*

**Types of items that could be included**
An extended response may be presented in a variety of modes, including written, spoken and/or multimodal.

*Written extended response*
• Examples may include reports, user documentation, client support materials and manuals, reviews, e.g. software, hardware, systems, networks, websites, magazine articles, disaster recovery plans, hypertext presentations, online responses such as blogs
• The response may be supported by references or, where appropriate, tables of data, diagrams and flow charts.

*Spoken extended response*
• Examples may include interviews, debates, webcasts, podcasts, and seminar presentations.

*Multimodal extended response*
• A multimodal presentation is one that uses a combination of modes, such as visual, electronic, physical, audio and/or spoken modes. It must combine a minimum of two modes, with both significantly contributing to the presentation and assessment decisions.
• Examples may include presentations, seminars conferences, and digital presentations, e.g. webpages, computer simulations and presentations using software.

**Further guidance**
• The student’s spoken or multimodal response is the focus for assessment decisions; however, supporting documentation will be required to substantiate decisions and for monitoring, verification and exit purposes. Techniques used will require students to present to a real audience (e.g. a speech), or a virtual audience through the use of technology.

**Conditions clearly stated on the assessment**

<table>
<thead>
<tr>
<th>Year 11</th>
<th>Year 12</th>
</tr>
</thead>
</table>
| • Written: **600–1000 words**  
• Spoken: **3–4 minutes**  
• Multimodal: **3–5 minutes**. | • Written: **800–1200 words**  
• Spoken: **4–5 minutes**  
• Multimodal: **5–7 minutes**. |

**Advice for teachers**
• Management of the extended response should be mostly the responsibility of the student. Supervision by the teacher may be necessary at times.
• Implement strategies to promote the authenticity of student work, e.g. teachers seeing plans and or drafts, collection of student work during writing process, teacher checklists.
Scaffolding must be provided. When an extended response assessment technique is undertaken for the first time, the scaffolding should help students complete the assessment by modelling the process and skills required. The scaffolding should not specify or lead the student through a series of steps dictating a solution. Scaffolding should be reduced from Year 11 to Year 12 to allow the student to better demonstrate independence. When an extended response is revisited (most likely in Year 12), the scaffolding should be reduced, e.g. as a series of generic questions.

- Provide learning experiences that support the mode and genre of the instrument, modelling the assessment technique where possible.

- Indicate on the assessment the dimensions and objectives that will be assessed, and explain the instrument-specific standards.

4.5.3 Product

Purpose

This technique assesses the development and creation of a digital product, service or solution and is the outcome of applying a range of cognitive, technical, physical, creative and/or expressive skills.

Description

- The focus of a product assessment is the application of skills to make, create or construct a digital product, service or solution.

- Product assessment is based on the application of:
  - knowledge, understanding and skills
  - analysis, synthesis and evaluation of data and/or information.

- Product assessment involves the creative input of students and the application of identified skill/s in providing a solution.

- The development of a product may also include documentation of the process.

- This assessment occurs over a period of time, in class, and often students’ own time.

Dimensions to be assessed

Product assessments are best used to determine student achievement in objectives from:

- Knowledge and communication
- Design and development
- Implementation and evaluation.

Types of items that could be included

There are two possible types of products — project and practical exercises.

Project

Projects involve applying problem-solving techniques to cater for particular needs. Time management and an appreciation of what can realistically be achieved in the given time frame are inherent in project planning.

There should be opportunity for both team and individual project work over the course of study.

It is essential that a project is documented through all its phases, as outlined in the project development model (see Table 2).
The documentation for a project has an extended written component which must involve complex analysis, synthesis of ideas and evaluation through the following:

- analysis of tasks, e.g. client brief, client proposal
- project management processes, e.g. Gantt chart, project scope, risk management plan
- record of development process, e.g. annotated screenshots, work log, teacher-annotated observations
- product testing
- contexts, inputs, processes and products.

Depending on the nature of the project, the written component may be enhanced by:

- user and technical documentation
- justification of design choices
- spoken or multimodal presentation, e.g. client proposal, product launch, product training.

Table 2 shows an example of how a project could be undertaken using a problem-solving model (refer also to Section 3.1.2).

**Table 2: Project development model (as seen in Section 3.1.2)**

<table>
<thead>
<tr>
<th>Phase</th>
<th>Brief description of what the phase encompasses</th>
<th>Documentation of all phases of the project, together with manuals (user and/or technical)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design</td>
<td>Identification</td>
<td>Clarification of the issue being examined involving clear statements of problem identification, rationale and aims.</td>
</tr>
<tr>
<td></td>
<td>Specification</td>
<td>Description of the type of outcome required, including the nature of inputs and outputs, hardware and software requirements and audience, as appropriate.</td>
</tr>
<tr>
<td></td>
<td>Design</td>
<td>Planning the details of the solution using a recognised methodology.</td>
</tr>
<tr>
<td>Develop</td>
<td>Application</td>
<td>Applying the design with the chosen software.</td>
</tr>
<tr>
<td></td>
<td>Testing</td>
<td>Testing for accuracy by checking for logical and syntactical errors.</td>
</tr>
<tr>
<td>Evaluate</td>
<td>Evaluation</td>
<td>Evaluate the contexts, inputs, processes and products (CIPP).</td>
</tr>
</tbody>
</table>

**Practical exercises**

Practical exercises involve information technology tasks which require students to demonstrate aspects of the problem-solving process. They may take a variety of forms, such as:

- creating a solution, product or service in response to an IT problem or client need
- demonstrating a practical solution to a scenario
- interacting with operating systems, e.g. installing and configuring an operating system or network, creating directory structures or optimising hard disk use
- presenting digital information such as software products or screen designs.

While the focus of practical exercises is on the practical aspect, the exercises may be supported by a written component.
Conditions clearly stated on the assessment

<table>
<thead>
<tr>
<th>Year 11</th>
<th>Year 12</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Projects</strong></td>
<td><strong>Projects</strong></td>
</tr>
<tr>
<td>• length: minimum 3 weeks</td>
<td>• length: minimum 4 weeks</td>
</tr>
<tr>
<td>• supervised and/or unsupervised</td>
<td>• supervised and/or unsupervised</td>
</tr>
<tr>
<td>• individual or group</td>
<td>• individual or group</td>
</tr>
<tr>
<td>• documentation: 800–1000 words (journal/log, tables, appendices and visual representations not included in word count)</td>
<td>• documentation: 1000–1500 words (journal/log, tables, appendices and visual representations not included in word count)</td>
</tr>
<tr>
<td><strong>Practical exercises</strong></td>
<td><strong>Practical exercises</strong></td>
</tr>
<tr>
<td>• supervised and/or unsupervised</td>
<td>• supervised and/or unsupervised</td>
</tr>
<tr>
<td>• individual or group</td>
<td>• individual or group</td>
</tr>
<tr>
<td>• length: maximum 2 weeks.</td>
<td>• length: maximum 3 weeks.</td>
</tr>
</tbody>
</table>

Advice for teachers

- Observe the development of the product throughout the unit of work.
- Provide learning experiences that support the mode and genre of the instrument, modelling the assessment technique where possible.
- Format the assessment to allow for ease of reading and responding. Consider the language needs of the students and avoid ambiguity.

4.6 Requirements for verification folio

A verification folio is a collection of a student’s responses to assessment instruments on which the level of achievement is based. For students who are to exit with four semesters of credit, each folio should contain the range of assessments for making summative judgments as stated below.

Students’ verification folios for Information Technology Systems must contain:

- a minimum of 4 and a maximum of 6 assessment instruments from Year 12
- evidence of each dimension being assessed summatively at least three times by verification
- one supervised written assessment which assesses all three dimensions
- one product (project) completed individually which assesses all three dimensions
- a student profile completed to date.

For information about preparing monitoring and verification submissions, schools should refer to the *The A–Z of Senior Moderation*, available at <www.qsa.qld.edu.au/1426.html>.

4.6.1 Post-verification assessment

In addition to the contents of the verification folio, there must be at least one subsequent summative assessment in the exit folio. It should reflect the stage of the course of study from which it comes. For this syllabus, students are to provide a response to one assessment instrument which assesses at least two dimensions.

4.7 Exit standards

The purpose of standards is to make judgments about students’ levels of achievement at exit from a course of study. The standards are described in the same dimensions as the objectives of the syllabus. The standards describe how well students have achieved the objectives and are stated in the standards matrix.
The following dimensions must be used:

- Dimension 1: *Knowledge and communication*
- Dimension 2: *Design and development*
- Dimension 3: *Implementation and evaluation*.

Each dimension must be assessed in each semester, and each dimension is to make an equal contribution to the determination of exit levels of achievement.

### 4.8 Determining exit levels of achievement

When students exit the course of study, the school is required to award each student an exit level of achievement from one of the five levels:

- Very High Achievement (VHA)
- High Achievement (HA)
- Sound Achievement (SA)
- Limited Achievement (LA)
- Very Limited Achievement (VLA).

Exit levels of achievement are summative judgments made when students exit the course of study. For most students this will be after four semesters. For these students, judgments are based on exit folios providing evidence of achievement in relation to all objectives of the syllabus and standards.

All the principles of exit assessment must be applied when making decisions about exit levels of achievement.

#### 4.8.1 Determining a standard

The standard awarded is an on-balance judgment about how the qualities of the student’s work match the standards descriptors overall in each dimension. This means that it is not necessary for the student to have met every descriptor for a particular standard in each dimension.

When standards have been determined in each of the dimensions for this subject, the following table is used to award exit levels of achievement, where A represents the highest standard and E the lowest. The table indicates the minimum combination of standards across the dimensions for each level.

<table>
<thead>
<tr>
<th>Exit Level</th>
<th>Standard Descriptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>VHA</td>
<td>Standard A in any two dimensions and no less than a B in the remaining dimension</td>
</tr>
<tr>
<td>HA</td>
<td>Standard B in any two dimensions and no less than a C in the remaining dimension</td>
</tr>
<tr>
<td>SA</td>
<td>Standard C in any two dimensions and no less than a D in the remaining dimension</td>
</tr>
<tr>
<td>LA</td>
<td>At least Standard D in any two dimensions</td>
</tr>
<tr>
<td>VLA</td>
<td>Standard E in the three dimensions</td>
</tr>
</tbody>
</table>

Some students will exit after one, two or three semesters. For these students, judgments are based on folios providing evidence of achievement in relation to the objectives of the syllabus covered to that point in time. The particular standards descriptors related to those objectives are used to make the judgment.

Further information can be found at [www.qsa.qld.edu.au/1426.html](http://www.qsa.qld.edu.au/1426.html).
## 4.8.2 Standards matrix

<table>
<thead>
<tr>
<th>Knowledge and communication</th>
<th>Standard A</th>
<th>Standard B</th>
<th>Standard C</th>
<th>Standard D</th>
<th>Standard E</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The student work has the following characteristics:</td>
<td>The student work has the following characteristics:</td>
<td>The student work has the following characteristics:</td>
<td>The student work has the following characteristics:</td>
<td>The student work has the following characteristics:</td>
</tr>
<tr>
<td></td>
<td>• accurate and comprehensive definitions, explanations and use of IT terms,</td>
<td>• accurate and detailed definitions, explanations and use of IT terms,</td>
<td>• definitions, explanations and use of IT terms, concepts and principles</td>
<td>• simple definitions, explanations and use of some IT terms, concepts and</td>
<td>• superficial definitions or explanations, and inconsistent use of IT terms, concepts or principles</td>
</tr>
<tr>
<td></td>
<td>concepts and principles</td>
<td>concepts and principles</td>
<td>principles</td>
<td>principles</td>
<td>principles</td>
</tr>
<tr>
<td></td>
<td>• coherent and clear communication of concepts, principles and design</td>
<td>• clear communication of concepts, principles and design processes using</td>
<td>• communication of concepts, principles and design processes using</td>
<td>• simple communication of concepts, principles and design processes using basic</td>
<td>• some communication of concepts, principles or design processes.</td>
</tr>
<tr>
<td></td>
<td>processes using mode, genre and language conventions discerningly.</td>
<td>mode, genre and language conventions effectively.</td>
<td>mode, genre and language conventions appropriately.</td>
<td>mode, genre and language conventions.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The student work has the following characteristics:</td>
<td>The student work has the following characteristics:</td>
<td>The student work has the following characteristics:</td>
<td>The student work has the following characteristics:</td>
<td>The student work has the following characteristics:</td>
</tr>
<tr>
<td></td>
<td>• comprehensive and discerning analysis of client needs, purpose and</td>
<td>• detailed analysis of client needs, purpose and scenarios to inform the</td>
<td>• analysis of client needs, purpose and scenarios to inform the design</td>
<td>• simple analysis of client needs, purpose or scenarios to inform aspects of</td>
<td>• superficial analysis of isolated aspects of client needs, purpose or</td>
</tr>
<tr>
<td></td>
<td>scenarios to inform the design plan</td>
<td>design plan</td>
<td>design plan</td>
<td>the design plan</td>
<td>scenarios</td>
</tr>
<tr>
<td></td>
<td>• thorough and systematic synthesis of information to design solutions</td>
<td>• effective synthesis of information to design solutions</td>
<td>• synthesis of information to design solutions</td>
<td>• superficial synthesis of information to design solutions</td>
<td>• statement of information or obvious solutions</td>
</tr>
<tr>
<td></td>
<td>• comprehensive development and thorough testing of components to refine</td>
<td>• logical development and reliable testing of components to refine solutions.</td>
<td>• development and testing of components to refine solutions.</td>
<td>• guided development and partial testing of components to refine solutions.</td>
<td>• guided development of isolated components to produce partial solutions.</td>
</tr>
<tr>
<td>Design and development</td>
<td>The student work has the following characteristics:</td>
<td>The student work has the following characteristics:</td>
<td>The student work has the following characteristics:</td>
<td>The student work has the following characteristics:</td>
<td>The student work has the following characteristics:</td>
</tr>
<tr>
<td></td>
<td>• use of a variety of complex technical skills and resources to present</td>
<td>• use of a variety of technical skills and resources to present an efficient</td>
<td>• use of technical skills and resources to present a solution</td>
<td>• use of basic technical skills and resources to present a partial solution</td>
<td>• use of isolated technical skills to produce an output</td>
</tr>
<tr>
<td>Implementation and evaluation</td>
<td>• discerning and thorough evaluation of solution against the defined</td>
<td>• effective evaluation of solution against the defined criteria, using</td>
<td>• evaluation of solution against the defined criteria, using CIPP.</td>
<td>• simple evaluation of solution against aspects of the defined criteria.</td>
<td>• statement of opinion about aspects of the defined criteria.</td>
</tr>
<tr>
<td></td>
<td>criteria, using CIPP.</td>
<td>CIPP.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## 5 Glossary

<table>
<thead>
<tr>
<th>Glossary term</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>accurate</td>
<td>Precise, to the point; consistent with a standard</td>
</tr>
<tr>
<td>appropriate</td>
<td>Fitting, suitable to the context</td>
</tr>
<tr>
<td>analysing</td>
<td>Dissecting data and information to ascertain and examine constituent parts and/or their relationships</td>
</tr>
<tr>
<td>basic</td>
<td>Underdeveloped, simple and straightforward</td>
</tr>
<tr>
<td>clear</td>
<td>Plainly and openly, without ambiguity</td>
</tr>
<tr>
<td>CIPP</td>
<td>Refers to the context, inputs, processes and products method of evaluation</td>
</tr>
<tr>
<td>complex</td>
<td>Relationships or interactions that have a number of elements, components or steps</td>
</tr>
<tr>
<td>coherent</td>
<td>Rational with parts that are harmonious, well structured and that make sense</td>
</tr>
<tr>
<td>comprehensive</td>
<td>Thorough and inclusive of a broad coverage of facts, ideas and information</td>
</tr>
<tr>
<td>detailed</td>
<td>Meticulous, specific, precise</td>
</tr>
<tr>
<td>discerning</td>
<td>Making thoughtful and astute choices</td>
</tr>
<tr>
<td>effective</td>
<td>Meeting the assigned purpose</td>
</tr>
<tr>
<td>efficient</td>
<td>Productive in effect, capability and proficiency</td>
</tr>
<tr>
<td>evaluating</td>
<td>Assigning merit according to criteria</td>
</tr>
<tr>
<td>genre</td>
<td>Genres are conventionalised, staged and purposeful text structures. A genre is based on shared knowledge and practices, and exhibits distinguishing structures, features and patterns that relate to context, purpose and audience.</td>
</tr>
<tr>
<td>innovative</td>
<td>Novel, but not necessarily unique, often involving effective alternatives, modification or changes to given information or routine tasks</td>
</tr>
<tr>
<td>isolated</td>
<td>One-off or unconnected</td>
</tr>
<tr>
<td>language conventions</td>
<td>Accepted language practices developed over time and generally used and understood, for example use of punctuation</td>
</tr>
<tr>
<td>logical</td>
<td>Rational and valid; internally consistent</td>
</tr>
<tr>
<td>mode</td>
<td>Mode refers to a system of communication chosen as the way to transmit a message. Modes may be written, spoken/signed, nonverbal, visual or auditory.</td>
</tr>
<tr>
<td>obvious</td>
<td>Easily understood, clear, apparent, predictable</td>
</tr>
<tr>
<td>partial</td>
<td>Attempted, with evidence provided, but incomplete</td>
</tr>
<tr>
<td>term</td>
<td>definition</td>
</tr>
<tr>
<td>-------------</td>
<td>---------------------------------------------------------------------------</td>
</tr>
<tr>
<td>relevant</td>
<td>Applicable and pertinent; has direct bearing on</td>
</tr>
<tr>
<td>reliable</td>
<td>Constant and dependable or consistent and repeatable</td>
</tr>
<tr>
<td>simple</td>
<td>Easy to understand and deal with; may concern a single or basic aspect, few steps, obvious data/outcomes, limited or no relationships</td>
</tr>
<tr>
<td>solution</td>
<td>Refers to a product or service</td>
</tr>
<tr>
<td>superficial</td>
<td>Apparent and sometimes trivial; lacking in depth</td>
</tr>
<tr>
<td>synthesising</td>
<td>Assembling constituent parts into a coherent, unique and/or complex entity</td>
</tr>
<tr>
<td>thorough</td>
<td>Including all that is required</td>
</tr>
<tr>
<td>variety</td>
<td>A number of different modes or sources; a range</td>
</tr>
</tbody>
</table>