VICTORIAN INFORMATION TECHNOLOGY TEACHERS ASSOCIATION

VITTA

in conjunction with

VICTORIAN CURRICULUM AND ASSESSMENT AUTHORITY

Grasping the Revised IT Study Design 2003

A FOCUS ON

- **Information Processing and Management**
- **Information Systems**
- **Units 1 and 2**

INFORMATION TECHNOLOGY STUDY DESIGN 2003 – 2006

Units 1 and 2; Information Processing and Management; Information Systems

The reaccredited Information Technology study design (accredited 1 January 2003 - 31 December 2006) was distributed to all schools in March for implementation in 2003. An overview of the key changes to the study design was included in the *VCE Bulletin*, No. 174, March 2002. A schedule of workshops to introduce teachers to the reaccredited study design was published in the *VCE Bulletin*, No. 176 May 2002.

Teachers should not the following advice in relation to the key knowledge detailed in the study design for course planning and assessment purposes.

In each unit of the Information Technology (2003-2006) study design, the key knowledge dot points for each outcome typically comprise a 'stem' statement, followed by 'including', 'for example' or 'such as'. Where a key knowledge dot point uses 'including' or a colon (:) then all of the items listed should be addressed in the teaching and learning program. This means that all items listed are required knowledge for the outcome.

Where a key knowledge dot point uses 'for example' or 'such as' followed by a list of items, then the stem of the dot point is the key knowledge required for the outcome. For course planning and assessment purposes, students may be required to draw on one or more of the examples to substantiate, justify or illustrate a point, but should not be required to demonstrate specific knowledge related to the examples. In such cases, teachers should incorporate into their assessment tasks, those examples that have formed part of student learning. For course planning purposes, teachers can select from the list the examples that will be covered in the teaching program.

VCE Bulletin, No. 177 June 2002.

Information Technology:

Information Technology Unit 1 &2

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1. Unit One: Focus

1.1 Unit One Focus: A Comparison Between Old And New

The focus of the new study is how individuals use, and can be affected by, information technology. This is a large shift from the old study, in which the major focus of Unit One was problem solving and decision making. The Internet forms an integral part of all areas of the new study.

Areas of Study:

- *IT techniques: solutions and outputs* – the use of information technology to solve problems
- *IT: possibilities and consequences* – reasons for using information technology and how lives are affected by these applications
- *IT: components of information systems* – functions and technical capabilities of hardware and software components of computer systems.

For this unit, there are no restrictions on the software tools that students can study.

1.2 Unit One Focus: Key Differences Explained

The new study focuses on students acquiring and applying knowledge and skills to create solutions that inform, persuade, educate and entertain. The output produced from solutions can be information, such as a flyer, or actions, such as the controlling of lights for a school musical.

The examination of hardware and software components includes an exploration of the technology used to publish and access information on the Internet, such as modems, browsers and transmission media, and an investigation of the methods taken by search engines to scan the web. Internet search strategies and the presentation characteristics of websites also feature in the study.

A major expansion in Unit One involves students critically evaluating the quality of information available from Internet sources. Ethical and legal considerations, such as copyright and privacy principles relating to the use of information acquired from the Internet are examined. The social effects of using information technology are investigated from the viewpoint of how they affect behaviour, attitudes and relationships.

1.3 Unit One Focus: The Importance of "IPEE" (inform, persuade, educate, entertain)

Throughout Unit One the purposes of producing information technology solutions are investigated . Students should examine how information technology solutions and output can inform, persuade, educate or entertain.

Purpose of Solution	*Examples of Solution and Output*
Inform (report about a current event)	° Factual reports ° Essays ° Minutes of meetings ° Biographies ° Literature, film reviews ° Newspaper reports
Persuade (assist in making decisions about a course of action)	° Advertising brochure ° Political policy statement ° Job applications ° Websites ° Jingles ° Letters of praise
Educate	° Computer-based tutorial CD-ROM

(increase level of understanding about a concept)	° A 'how-to' manual
Entertain (amuse)	° Computer games ° Films ° Theatrical/drama scripts ° Lyrics ° Stories

This may mean that students complete a range of learning activities in which they create solutions that fulfill different purposes. If they create a solution that fulfills only one of these purposes for Outcome One, they should experience solutions and output that fulfill a variety of purposes as they progress through the key knowledge associated with Unit One.

2. Unit Two: Focus

2.1 Unit Two Focus: A Comparison Between Old And New

The focus of the new study is how individuals and **organisations** use, and can be affected by, information systems. This is less of a shift from the old study (in comparison to Unit One), in which the major focus of Unit Two was how information systems are used to produce and manage information. However the content of the Unit has been significantly altered and updated.

Areas of Study:

- *IT techniques: processes and management* – the techniques, procedures and methods for efficiently and effectively processing data and managing information
- *IT: applications and implications* – reasons for using information systems, and how individuals and organisations are affected by these applications
- *IT: information systems* – the types and characteristics of networked information systems.

For this unit, students should use at least two software tools. One software tool must be capable of controlling systems or managing information. (Outcome One) This could include programming languages, databases or spreadsheets. The other software tool must be capable of producing an electronic publication for use on a network. (Outcome Two) This could include web authoring, multimedia authoring or presentation software. Students may continue to use a software tool studied in Unit One.

There are no prerequisites for entry into Unit Two – students may commence study of this unit without achieving a satisfactory result in, or completing Unit One.

2.2 Unit Two Focus: Key Differences Explained

Within the new study students are required to work in a team to coordinate the creation of an electronic publication. This involves students learning about strategies to coordinate human and technical resources such as identifying tasks, developing timelines and allocating responsibilities, and subsequently implementing a project plan. Students are required to evaluate how their electronic publication fulfills social, ethical and legal responsibilities. This may involve acknowledging copyright laws and privacy principles, and assessing that material presented within the site does not place groups or individuals at risk.

A major expansion in Unit Two involves students designing a small local area network (LAN) of two to four computers. This incorporates an investigation of network topographies, operating systems, architecture and data communications systems. Students are required to examine the economic effects related to the implementation of a network, such as training expenses associated with implementing a new system or cost savings associated with sharing of peripherals

3. Unit One: Areas of Study

*3.1 Unit One Areas of Study: Our Interpretation of **Modifications***

Area Of Study 1:

Dot Point 1

- Inclusion of 'data'
- Characteristics are emphasized; 'characteristics' = 'nature'

Dot Point 4

- 'Data' has become 'information'

Dot Point 5

- SDLC stages (problem-solving methodology) are specified – *analyse, design, develop, test, document, implement and evaluate*

Dot Point 6

- Inclusion of 'output' probably because a lot of designs are not of total solutions, but they are of components of solutions

Dot Point 7

- Steps of information processing cycle are specified: acquisition, input, validation, manipulation, storage, output, communication, retrieval and disposal – this indicates that these steps should be followed

Dot Point 8

- 'Transforming' has become 'acquiring' and 'manipulating' – limits the techniques to two – getting and processing data

Dot Point 13

- 'Data' has become 'information'

Dot Point 15

- Inclusion of 'data'

Area Of Study 2:

Dot Point 1

- Types of IT (implied study of information technology)
- IPEE

Dot Point 2

- Previously examined organisational uses of IS, however, now this is limited to 'personal' uses of computer systems

Dot Point 3

- Focus has shifted to behaviour, relationships and attitudes from social, economic and health and safety effects of technology

Dot Point 4

- Emphasis on 'ethical' and 'legal' effects

Dot Point 5

- Social effects are specified as impact upon 'personal opinions or decisions, such as gender, race and cultural context.'

Area Of Study 3:

Dot Point 1

- Inclusion of 'functions'
- Omission of 'used to produce information' which was redundant anyway

Dot Point 5

- Now there is a focus on 'peripheral devices' only

*3.2 Unit One Areas Of Study: **New** Dot Points – Our Interpretation*

Area Of Study 1:

Dot Point 2 – Types of solutions that can be created through the use of information technology

- Solutions can be created through the use of information technology to produce updateable information that informs (reports about a current event), persuades (assists in making decisions about a course of action), educates (increases the level of understanding of a concept) or entertains (amuses).

Dot Point 3 – Types of information that informs, persuades, educates or entertains

- Flyers may inform about an event, advertisements may be used to persuade consumers to purchase a product, instruction manuals may be used to educate users or computer games may be used to entertain.

Dot Point 9 – Internet search strategies for expanding or refining the scope of information sought

- Search strategies may include identifying keywords and synonyms for the information required, or using search strings or Boolean operators.

Dot Point 11 – Presentation characteristics of websites that fulfill different purposes

- Action based designs may be used for sites that are used to entertain, elaborate designs may be used for sites that intend to persuade, or basic designs may be used for sites that educate. Text-equivalent versions of images may be used to inform people with special needs.

Dot Point 12 – Criteria for evaluating the effectiveness of solutions and output

- Incorporates readability, completeness, attractiveness, accuracy, ease of use, achievement of purpose

Dot Point 14 – Criteria for evaluating the credibility of electronic and non-electronic information sources

- Criteria may include authority, currency and cultural context

Area Of Study 3:

Dot Point 2 – Relationships between the capabilities of the hardware and software components

- Examples include colour fonts used in a word processor will print black on a black and white printer, or a low-resolution monitor will give a poor display of high-quality photographs

Dot Point 3 – Overview of computer system architecture

- Includes main components and their connections: CPU, buses, RAM, keyboard, disk drives, mouse and essential peripherals

Dot Point 4 – Factors affecting the design of a computer system

- Compatibility of components, ability to produce required information, ability to fulfill required functions such as running a DVD, cost, ease of use, need to secure confidential information or health and safety considerations (such as the weight of a laptop)

Dot Point 6 – Roles and capabilities of the technology used to publish and access information on the Internet

- Incorporates the study of modems to convert and transmit signals, browsers to translate the code of web pages and display the results and transmission media to connect computers (telephone lines, fibre optic cable)

Dot Point 7 – Methods taken by search engines to scan the web

- This may include investigating search engines that index on the basis of keywords, topic headings or concepts, and meta-search engines that compile the results of multiple search engines or enable the searching of several engines from the one place

4. Unit Two: Areas of Study

*4.1 Unit Two Areas Of Study: Our Interpretation of **Modifications***

Area Of Study 1:

Dot Point 7

- Similar to old Area Of Study 1: Dot Point 9.
- The problem-solving methodology mentioned in the Study Design has changed to include: Analysis, Design, *Develop*, *Test*, *Document*, Implement and Evaluate

Dot Point 8

- Similar to old Area Of Study 1: Dot Point 3.
- This dot point now includes the words "*and output*".
- Design techniques that show the design of output rather than solutions can now be explored (e.g. in the past some teachers chose not to look at certain design methodologies because they did not represent the entire solution).

Dot Point 9

- Similar to old Area Of Study 1: Dot Point 1.
- The phases of the IPC have been clearly defined to include: Acquisition, Input, Validation, Manipulation, Storage, Retrieval, Output, Communication & Disposal.

Dot Point 10

- Similar to old Area Of Study: Dot Point 4.
- Methods & Techniques for *acquiring and manipulating* data and information.
- This dot point has changed to the extent that it now limits the methods and techniques required to two elements of the IPC only. In the past other phases could have been looked at.

Dot Point 13

- This dot point matches the old Area Of Study 1: Dot Point 6 except the word "effectively" has been added.
- As a result, students will need to look at the elements of effectiveness when reviewing the procedures and techniques used for managing the storage, communication, retrieval and disposal of information.

Dot Point 15

- Similar to old Area Of Study 1: Dot Point 8, except the words "…of '*solutions and'* output" have been added.

Area Of Study 2:

This Area Of Study does match some of the old Area Of Study 3, but is really brand new. See next section for more detail.

Area Of Study 3:

Dot Point 1

- Similar to old Area Of Study 2: Dot Point 3.
- The word "functions" has been added to the criteria. The words mean:
  - ✓ *Function = The tasks performed by information system components.*
  - ✓ *Characteristics = The identifying elements of a piece of hardware or software.*
  - ✓ *Capabilities = How well a piece of hardware or software can perform its function(s).*

Dot Point 2

- Similar to old Area Of Study 2: Dot Point 1.
- The word "purposes" has been deleted from this dot point in the new Study Design.
- The words "individuals and organisations" have been added. These words encourage teachers to look beyond just one style of information system (e.g. the one used by organisations), and encourages the teacher to provide materials to help students learn about information systems used by individuals as well.

Dot Point 3

- Similar to old Area Of Study 2: Dot Point 2.
- The components of Information Systems have been included in the new Study Design.

*4.2 Unit Two Areas Of Study: **New** Dot Points – Our Interpretation*

Area Of Study 1

Dot Point 1 – Characteristics of data and information and reasons for their use

- Characteristics include unprocessed, unorganised and discrete nature of data, and the refined, organised and value-added nature of information. Reasons for use cover the four factors previously defined – to inform, persuade, educate or entertain.

Dot Point 2 – Characteristics of information produced for different purposes

- The characteristics of information could include structure, form, nature of output or method of acquiring data.

Dot Point 3 – Purposes of solutions

- Solutions can be used to control systems (capture data from a water pollution recording program) or manage information (spreadsheet files used to monitor cash flows)

Dot Point 4 – Types of information required for different purposes

- Different purposes refers to information that informs, persuades, educates or entertains.

Dot Point 5 – Sources of information

- Sources of information could include mass media (radio, television, newspapers, magazines) or electronic resources (CD-ROM's, Internet)

Dot Point 6 – Factors affecting the quality of solutions and output

- Ease of use, attractiveness, readability, accuracy of information

Area Of Study 2

Dot Point 1 – Reasons for individuals and organisations using information systems

- Entertainment, sharing of resources, management of personal or business finances, predicting business outcomes

Dot Point 2 – Settings in which information systems are used

- Homes or organisations such as sole traders, partnerships, government departments, public companies or cooperatives

Dot Point 3 – Social, legal and ethical considerations relating to the creation of an electronic publication

- Requesting permission to establish an external link from an existing website, acknowledging copyright laws and privacy principles or including information that does not place individuals or groups at risk, or offend sections of the community

Dot Point 4 – Economic effects on individuals and organisations relating from the implementation of networks

- The ability to work from home reduces traveling costs, acquisition of new skills may incur a training expense, improved communications speed may improve decision-making, or sharing resources reduces costs

Area Of Study 3

Dot Point 4 – Types of networks and data communications systems

- Local area networks, (LAN), wide area networks (WAN), fibre optic cabling and wireless links

Dot Point 5 – An overview of network topographies, including strengths and weaknesses

- Star (some strengths and weaknesses: hub prevents collisions between messages, and if one communication line broken, rest of network continues to operate, if central hub goes down, entire network will stop), Ring (some strengths and weaknesses: messages only flow in one direction, no danger of collisions, if a connection is broken entire network stops working.) and Bus (some strengths and weaknesses: may be organised as client/server or peer-to-peer, if the single connection path is broken, network will stop working.)

Dot Point 6 – An overview of network operating systems and network architecture

- Network operating system tasks include administration, file management, printer management, security. Network architecture relates to how the physical components of the network are connected.

Dot Point 7 – Factors affecting the design of a networked information system

- Compatibility of components, bandwidth, ability to produce required information, cost, need to secure confidential information or ability to fulfill required functions.

5. Useful Resources

There are a series of useful references in the New Study Design:

- The Rationale and Aims of the Study (page 7).
- The Structure of the Study, Equipment Requirements etc… (page 8 & 9).
- Assessment & Reporting Requirements (page 10 & 11).
- Unit One Defined (pages 12 to 18).
- Unit Two Defined (pages 19 to 25).
- Advice To Teachers (pages 54 to 64).
- Glossary Of Terms (pages 80 to 86).
- Suitable Resources (pages 91 & 92).

6. Unit One: Outcome One

6.1 Outcome One Defined

New Study Design, Unit One, Outcome One (page 14)

On completion of this unit the student should be able to use information technology to create a solution that informs, persuades, educates or entertains, and to describe how behaviour, attitudes and relationships are affected by the use of information technology for this purpose.

6.2 How The Key Knowledge Points Match up With The Area Of Study Points

Key Knowledge	*Area of Study Dot Point*
▪ Types of solutions that can be created through the use of information technology to produce updateable information that informs, persuades, educates or entertains	▪ AOS 1 DP 2
▪ Types of information that informs, persuades, educates or entertains	▪ AOS 1 DP 3
▪ Characteristics of information produced for different purposes, such as structure; form; layout and meaning of text and symbols	▪ AOS 1 DP 1
▪ Functions, characteristics, capabilities and limitations of hardware and software components used to produce solutions and output	▪ **AOS 3 DP 1*
▪ A problem-solving methodology to analyse, design, develop, test, document, implement and evaluate solutions and output that meet the needs of informing, persuading, educating or entertaining	▪ AOS 1 DP 5
▪ Techniques for representing the design of solutions and output	▪ AOS 1 DP 6
▪ An overview of the major steps associated with information processing: acquisition, input, validation, manipulation, storage, output, communication, retrieval and disposal	▪ AOS 1 DP 7
▪ Techniques for manipulating data and information	▪ AOS 1 DP 8
▪ Formats and conventions applied to information in order to achieve its purpose	▪ AOS 1 DP 10
▪ Criteria for evaluating the effectiveness of a solution and output	
▪ Procedures for effectively managing the production and handling of data and information related to the creation of a solution and output	▪ AOS 1 DP 12 ▪ AOS 1 DP 15
▪ Effects on behaviour, attitudes and relationships resulting from the use of information technology for the purposes of informing, persuading, educating or entertaining.	▪ **AOS 2 DP 3*
** Note the required knowledge for this outcome is mainly covered in Area of Study One (IT techniques: solutions and outputs) apart from the two marked points. **	

6. Unit One: Outcome One (Cont…)

6.3 Key Skills – Sample Activities & Questions To Satisfy The Key Skills Of Outcome One

Key Skill	Sample Activities/Questions etc…
• *Identify the characteristics of information that meets the identified need stated in a design brief.*	o Brainstorm some ideas about what information is needed in a particular problem. o Identify the characteristics of the information included in any solution developed. o Provide a series of questions directing students to comment on the structure, form, layout and meaning of text, symbols etc... *(see Study Design – Outcome 1: Key Knowledge dot point 3.)* o Students to document the characteristics of information required in some way: for example: compile a list, concept map, mind map, report, table etc…
• *Apply techniques to represent the design of a solution (and output, where appropriate)*	o Students to produce one Layout Design, and one Process Design. (Or if you prefer – and depending on the task being undertaken – one Input Design, one Process Design, and one Output Design.) o Examples of Process Designs: *Structure Charts, IPO Charts (in part), Flow Charts, Gantt Charts, PERT Charts (extended), DFD's, Decision Trees, Structured English Charts (can be), etc…* o Examples of Layout Designs: *IPO Charts (in part), Story Boards, Web Map, Pseudocode, Annotated Diagrams, Screen Captures, Entity Relationship Diagrams, Data Dictionaries etc…*

6. Unit One: Outcome One (Cont…)

6.3 Key Skills – Sample Activities & Questions To Satisfy The Key Skills Of Outcome One (Cont…)

Key Skill	Sample Activities/Questions etc…
• *Select appropriate software tools and apply suitable functions, formats and conventions to process data and produce an effective solution (and output, where appropriate)*	o What sort of task to provide? ✓ *One general task* ✓ *A series of smaller tasks (pseudo-folio)* o What functions to use? ✓ *Provide a broad task in which students can choose the relevant functions they think are appropriate in creating a solution.* ✓ *Provide students with minimum requirements, which must be met to complete the task.* o What formats & conventions are appropriate? ✓ *Teacher defined.* ✓ *Students brainstorm and define them as part of a classroom activity.* ✓ *See Study Design – Unit One, Outcome One, Key Knowledge dot point 9 for more information.* ✓ *See Information Processing & Management text (Meyenn, Graham, Thatcher) p 62-63.* ✓ *See IT @ Work text pp 104-135.* o What is an effective solution? ✓ *The Study Design states that students should produce a solution that is readable, complete, attractive, accurate, easy to use, and achieves its intended purpose (see Study Design – Unit One, Outcome One, Key Knowledge dot point 10).* ✓ *Teacher assesses solution against these criteria.* ✓ *See Key Skills dot point 5 (this section) for more information.*

6. Unit One: Outcome One (Cont…)

6.3 Key Skills – Sample Activities & Questions To Satisfy The Key Skills Of Outcome One (Cont…)

Key Skill	**Sample Activities/Questions etc…**
• *Apply techniques and procedures to manage the production and handling of electronic files*	o According to Study Design (Unit One, Outcome One, Key Knowledge dot point 11) this involves looking at methods used to back up files, apply virus-checking methods, structure file directories, and use appropriate file directories and naming conventions. o What Can We Get Students To Do? *(a) Backing Up* ✓ *Back up all files to floppy disk.* ✓ *Produce screen captures of backing up processes.* ✓ *Problems: Network share privileges!* *(b) Virus Checking:* ✓ *Produce screen captures of the process.* ✓ *Print the log files from a Virus Scan.* *(c) Structuring Files & Directories* ✓ *Produce a design of files and directory structure as part of the design process.* ✓ *Create screen dumps showing Windows Explorer view of folder contents (particularly relevant for those teachers who do not have access rights to student folders).* ✓ *Teachers could look in student network drives to view file and directory structures.* *(d) Naming Conventions* ✓ *Teacher, student or class could define relevant naming conventions.* ✓ *Student would then be marked in accordance with their adherence to the naming conventions mentioned above.*

6. Unit One: Outcome One (Cont…)

6.3 Key Skills – Sample Activities & Questions To Satisfy The Key Skills Of Outcome One (Cont…)

Key Skill	Sample Activities/Questions etc…
• *Evaluate a solution (and output, where appropriate) in terms of its effectiveness in meeting an identified need*	o Study Design (Unit One, Outcome One, Key Knowledge dot point 10) states that relevant criteria for evaluating the effectiveness of a solution and output include: readability, completeness, attractiveness, accuracy, ease of use, achievement of purpose. o Students could assess their solution, OR another student's solution, using one or more of these criteria. o Students could: ✓ *Write a Report* ✓ *Prepare a Table rating the solution against key criteria like Reliability, Relevance, Accuracy, Attractiveness, Completeness, ease of use, and achievement of purpose.* ✓ *As above except student may be expected to rate one or more solutions in terms of the above criteria.* ✓ *Prepare an Oral Presentation* ✓ *Conduct Peer Evaluation* ✓ *Prepare a Survey/Questionnaire for a particular audience* ✓ *The class could brainstorm some of the characteristics that make up a "good" solution.* ✓ *Student may be required to do one or more of the above, AND prepare some form of conclusion.*
• *Describe how behaviour, attitudes or relationships are affected by using information technology for the purpose of informing, persuading or entertaining*	o Students could complete a report covering this Key Skill. o Students could be provided with one or more questions asking questions relevant to this Key Skill. o Students could review how key factors comprising the "use of the solution" affect behaviour, attitudes and relationships. (See Table One).

6. Unit One: Outcome One (Cont…)

6.4 Types Of Tasks That Could Be Set

- One large Case Study that requires students to satisfy key requirements based on the Key Skills.
- Smaller Case Studies that require students to satisfy smaller sub-components of the Outcome.
- A combination of the above points.

6.5 Examples Of Solutions And Outputs

(From New Study Design, Advice For Teachers, page 57)

Purpose Of Solution	**Examples Of Solutions And Output**
Inform (report about a current event)	✓ *Factual reports* ✓ *Essays* ✓ *Minutes of Meetings* ✓ *Biographies* ✓ *Literature, film reviews* ✓ *Newspaper Reports*
Persuade (assist in making decisions about a course of action)	✓ *Advertising Brochure* ✓ *Political Policy Statement* ✓ *Job Applications* ✓ *Websites* ✓ *Jingles* ✓ *Letters Of Praise*
Educate (increase level of understanding of a concept)	✓ *Computer-based tutorial CD-ROM* ✓ *A "how-to" manual* ✓ *(An educational website)*
Entertain (amuse)	✓ *Computer games* ✓ *Films* ✓ *Theatrical/drama scripts* ✓ *Lyrics* ✓ *Stories*

7. Unit One: Outcome Two

7.1 What Is It?

New Study Design, Unit One, Outcome Two (page 15)

On completion of this unit the student should be able to propose and justify the components and configuration of a computer system to meet a personal need.

7.2 How The Key Knowledge Points Match up With The Area Of Study Points

Key Knowledge	*Area of Study Dot Point*
▪ Settings in which computer systems are used to create solutions and output that inform, persuade, educate or entertain.	▪ AOS 2 DP 1
▪ Personal uses of computer systems	▪ AOS 2 DP 2
▪ Functions, characteristics, capabilities and limitations of hardware and software components	▪ AOS 3 DP 1
▪ Sources of information about the characteristics and capabilities of hardware and software components	▪ **AOS 1 DP 4*
▪ Factors to consider when installing peripherals such as compatibility between components and interfacing issues	▪ AOS 3 DP 5
▪ Overview of computer system architecture including the main components and their connections	▪ AOS 3 DP 3
▪ Relationships between the capabilities of the hardware and software components	▪ AOS 3 DP 2
▪ Factors affecting the design of a computer system	▪ AOS 3 DP 4
** Note this outcome draws knowledge from all three Areas of Study, in particular Area Two (IT: possibilities and consequences) and Three (IT: components of information systems). **	

7. Unit One: Outcome Two (Cont…)

7.3 Key Skills – Sample Activities & Questions To Satisfy The Key Skills Of Outcome Two

This Outcome would typically be completed as a whole rather than by satisfying the individual Key Skills as specified in the Study Design. For an example of such a task, see New Study Design, "Advice To Teachers", Sample Unit One Outcome Three page 59.

An assessment task could require the student to:

(i) Identify what makes up a computer system, and describe the functions of these components.

(ii) Conduct research on the characteristics, capabilities, prices etc of various types of components of computer systems. This might involve:
- ✓ *research into various component parts (e.g. CPUs, RAM, Motherboards etc),*
- ✓ *research into various packages (e.g. a Condor PIV 256/20 Multimedia Computer System that comes with…)*
- ✓ *research from the Internet, The Age, The Australian, computer magazines, by visiting computer stores etc…*

(iii) Diagrammatically represent the alternatives.
- ✓ *Teachers could provide a template including pictures of "typical" components and students may be expected to piece the pictures together.*
- ✓ *Alternatively, students could produce a website which contains hot spots at key points on a picture of a computer system.*
- ✓ *Students could use PowerPoint and Action Buttons in a similar manner.*

(iv) Produce a report outlining the advantages and disadvantages of a package or of each package being investigated.

(v) Write a justification on which system is their preferred system, or on why people should buy the system they have researched.

7. Unit One: Outcome Two (Cont…)

7.4 Types Of Tasks That Could Be Set

- A general case study with questions.
- Provide students with a worksheet containing a series of alternatives and tasks, which require the student to answer relevant questions.
- Provide students with a worksheet containing descriptions of a number of users that requires the student to research and recommend computer systems relevant to each user.
- Complete a test or report.
- Build a website which educates other students at school on various computer systems that may be relevant for use in the classroom (e.g. Notebook Program-type investigation).
- Compile a website, PowerPoint slideshow or brochure-type solution in the form of a Buyer's Guide to PCs.
- Create a multimedia journey into the nature, characteristics etc of a computer system.
- Complete one of more of the above points.

8. Unit One: Outcome Three

8.1 What Is It?

New Study Design, Unit One, Outcome Three (page 16)

On completion of this unit the student should be able to assess the extent to which the quality of information acquired via the Internet influences personal opinions or decisions.

8.2 How The Key Knowledge Points Match up With The Area Of Study Points

Key Knowledge	*Area of Study Dot Point*
▪ Roles and capabilities of the technology used to publish and access information on the Internet	▪ AOS 3 DP 6
▪ Characteristics of data and information such as the unprocessed, unorganised and discrete nature of data; the refined, organised and value-added nature of information	▪ AOS 1 DP 1
▪ Reasons for using information; for example, to inform, persuade, educate or entertain	▪ AOS 1 DP 1
▪ Factors affecting the quality of information	▪ AOS 1 DP 13
▪ Criteria for evaluating the credibility of Internet sources, such as authority, currency, cultural context	▪ AOS 1 DP 14
▪ Presentation characteristics of websites that fulfill different purposes	▪ AOS 1 DP 11
▪ Methods taken by search engines to scan the web	▪ AOS 3 DP 7
▪ Internet search strategies for expanding or refining the scope of information sought	▪ AOS 1 DP 9
▪ Ethical and legal considerations relating to the use of information acquired from the Internet	▪ AOS 2 DP 4
▪ Factors affecting personal opinions or decisions, such as bias, cultural context and peer pressure.	▪ AOS 2 DP 5
** Note this outcome draws knowledge from all three Areas of Study**	

8. Unit One: Outcome Three (Cont…)

8.3 Key Skills – Sample Activities & Questions To Satisfy The Key Skills Of Outcome Three

Key Skill	Sample Activities/Questions etc…
• *Explain why information is required to assist in shaping personal opinions or making personal decisions.*	o Brainstorm some ideas about what information is needed in order to shape an opinion on a particular topic, and look at why we need that information (to IPEE). o Provide a series of short answer questions based on this dot point. o Students could also be asked to keep a journal including: ✓ *what internet sites they visited;* ✓ *how they found their preferred sites;* ✓ *the characteristics they liked of their preferred sites;* ✓ *an explanation as to how they used the information contained within the site to help them shape their opinion on the issue-at-hand.*
• *Construct and perform an Internet search strategy to access information relating to an identified need.*	o Students to identify keywords, strings, phrases, synonyms etc… o Students provide additional techniques, which they could use (e.g. Boolean strings, Metasearching etc…) o Fill in a Search Form (see Table Two). o Students create their own search forms and then fill it in for a particular topic. o The class could brainstorm a topic and come up with ideas on how a particular search could be conducted. o Students provide Concept Maps, Mind Maps etc of their search strategy.

Key Skill	Sample Activities/Questions etc…
• *Compare the approach taken by different search engines to locate information.*	o Students compile a table of results from different search engines. o Students answer a series of questions, or the class may conduct a brainstorming session(s) based around a series of questions. (For Sample Questions, see Table Three.) o Students write a report including information on the different ways their chosen search engines search for (and return) data.
• *Evaluate how the presentation of the information affects the impact of a message.*	o Students complete: ✓ *check lists;* ✓ *short answer questions;* ✓ *a report;* o Students design and complete their own checklist.
• *Examine and compare information from various Internet sources to evaluate the reliability, accuracy, authority, completeness, accessibility, timeliness and points of view or bias.*	o Students can complete a table like the Table provided (see Table Four).

8. Unit One: Outcome Three (Cont…)

8.3 Key Skills – Sample Activities & Questions To Satisfy The Key Skills Of Outcome Three (Cont…)

Key Skill	Sample Activities/Questions etc…
• *Store relevant information, use appropriate file management procedures and techniques.*	o Bookmark sites found. o Copy and paste sites found into a Word document/Internet site/PowerPoint presentation and include an appropriate description. o Document their file management and site history. o Build a web page including their top five sites and outline the information that is available from these sites.
• *Use information technology to present a comparison of the quality of the information retrieved and an explanation of how differences in quality affect the extent to which the information can be relied on for validating personal opinions or decisions.*	o Prepare a spreadsheet of their (e.g.) five preferred sites found and rank each site according to the criteria in Table Four. This data could then be used to create a graph. o Prepare a report on which site researched is the best and why. This may include a description of how each website rates against the above-mentioned criteria.
• *Apply suitable citing techniques for each information source.*	o Use the citing methodology most relevant to your school.

8. Unit One: Outcome Three (Cont…)

8.4 Types Of Tasks That Could Be Set

- Teachers specify an issue for research.
- Students define their own issue.
- Students analyse, design, construct, implement, evaluate and document results from an Internet Search strategy.

9. Unit Two: Outcome One

9.1 What Is It?

New Study Design, Unit Two, Outcome One (page 21)

On completion of this unit the student should be able to use information technology to create a solution that controls a system or manages information, and evaluates the efficiency of processing and the effectiveness of the solution.

9.2 How The Key Knowledge Points Match up With The Area Of Study Points

Key Knowledge	*Area of Study Dot Point*
▪ Characteristics of information produced for different purposes such as structure, nature of output, methods of acquiring data	▪ AOS 1 DP 2
▪ Purposes of solutions, including controlling systems and managing information	▪ AOS 1 DP 3
▪ Functions, characteristics, capabilities and limitations of hardware and software components used to create solutions and output	▪ **AOS 3 DP 1*
▪ A problem solving methodology: analyse, design, develop, test, document, implement and evaluate	▪ AOS 1 DP 7
▪ Factors affecting the quality of solutions and output such as ease of use, attractiveness, readability, accuracy of information	▪ AOS 1 DP 6
▪ Techniques for representing the design of solutions and output	▪ AOS 1 DP 8
▪ An overview of the major steps associated with information processing: acquisition, input, validation, manipulation, storage, output, communication, retrieval and disposal	▪ AOS 1 DP 9
▪ Methods and techniques to enhance the quality of data	▪ AOS 1 DP 11
▪ Techniques for manipulating data and information	▪ AOS 1 DP 10
▪ Formats and conventions applied to information in order to achieve its purpose	▪ AOS 1 DP 12
▪ Criteria for evaluating the efficiency of processing and effectiveness of a solution and output	▪ AOS 1 DP 16
▪ Procedures and techniques for managing the storage, communication, retrieval and disposal of information	▪ AOS 1 DP 13
** Note the required knowledge for this outcome is mainly covered in Area of Study One (IT techniques: processes and management) apart from the one marked point. **	

9. Unit Two: Outcome One (Cont…)

9.3 Key Skills – Sample Activities & Questions To Satisfy The Key Skills Of Outcome One

Key Skill	**Sample Activities/Questions etc…**
• *Identify the characteristics of a solution (and output, where appropriate) that enable it to meet an identified purpose*	o Brainstorm some ideas about the characteristics in terms of structure (detailed information; aggregated information; sampled information), nature of output & methods of acquiring data o Identify the characteristics of the information via series of questions relating to structure, nature of output & methods of acquiring data o Give students samples of different programs, spreadsheets or databases and identify their unique characteristics in terms of structure, nature of output & methods of acquiring data o Students to document the characteristics of the solution required in some way: for example: compile a list, concept map, mind map, report, table etc… o Identify the purpose of the information via a series of questions relating to structure nature of output & methods of acquiring data
• *Apply techniques to represent the design of a solution (and output, where appropriate)*	o Students to produce one Layout Design, and one Process Design. (Or if you prefer – and depending on the task being undertaken – one Input Design, one Process Design, and one Output Design.) o Examples of Process Designs: *Structure Charts, IPO Charts (in part), Flow Charts, Gantt Charts, PERT Charts (extended), DFD's, Decision Trees, Structured English Charts (can be), etc…* o Examples of Layout Designs: *IPO Charts (in part), Story Boards, Web Map, Pseudocode, Annotated Diagrams, Screen Captures, Entity Relationship Diagrams, Data Dictionaries etc…*

9. Unit Two: Outcome One (Cont…)

9.3 Key Skills – Sample Activities & Questions To Satisfy The Key Skills Of Outcome One (cont…)

Key Skill	Sample Activities/Questions etc…
• *Select appropriate software tools and apply suitable functions, formats and conventions to process data efficiently and produce an effective solution (and output, where appropriate)*	o What sort of task to provide? ✓ *One general task* ✓ *A series of smaller tasks (pseudo-folio)* o What functions to use? ✓ *Provide a broad task in which students can choose the relevant functions they think are appropriate in creating a solution.* ✓ *Provide students with minimum requirements, which must be met to complete the task.* o What formats & conventions are appropriate? ✓ *Teacher defined.* ✓ *Students brainstorm and define them as part of a classroom activity.* ✓ *See Study Design – Unit One, Outcome One, Key Knowledge dot point 9 for more information.* ✓ *See Information Processing & Management text (Meyenn, Graham, Thatcher) p 62-63.* ✓ *See IT @ Work text pp 104-135.* o What is an effective solution? ✓ *The Study Design states that students should produce a solution that is readable, complete, attractive, accurate, easy to use, and achieves its intended purpose (see Study Design – Unit One, Outcome One, Key Knowledge dot point 10).* ✓ *Teacher assesses solution against these criteria.* o *See Key Skills dot point 5 (this section) for more information*

9. Unit Two: Outcome One (Cont…)

9.3 Key Skills – Sample Activities & Questions To Satisfy The Key Skills Of Outcome One (cont…)

Key Skill	Sample Activities/Questions etc…
• *Apply techniques and procedures to manage the production and handling of electronic files*	o According to Study Design (Unit One, Outcome One, Key Knowledge dot point 11) this involves looking at methods used to back up files, apply virus-checking methods, structure file directories, and use appropriate file directories and naming conventions. o What Can We Get Students To Do? *(a) Backing Up* ✓ *Back up all files to floppy disk.* ✓ *Produce screen captures of backing up processes.* ✓ *Problems: Network share privileges!* *(b) Virus Checking:* ✓ *Produce screen captures of the process.* ✓ *Print the log files from a Virus Scan.* *(c) Structuring Files & Directories* ✓ *Produce a design of files and directory structure as part of the design process.* ✓ *Create screen dumps showing Windows Explorer view of folder contents (particularly relevant for those teachers who do not have access rights to student folders).* ✓ *Teachers could look in student network drives to view file and directory structures.* *(d) Naming Conventions* ✓ *Teacher, student or class could define relevant naming conventions.* ✓ *Student would then be marked in accordance with their adherence to the naming conventions mentioned above.*

9. Unit Two: Outcome One (Cont…)

9.3 Key Skills – Sample Activities & Questions To Satisfy The Key Skills Of Outcome One (cont…)

Key Skill	Sample Activities/Questions etc…
• *Evaluate the efficiency of processing data and the effectiveness of the solution (and output, where appropriate)*	o Study Design (Unit Two, Outcome One, Key Knowledge dot point 11) states that relevant criteria for evaluating the efficiency of a solution and output include speed, effort and cost of processing techniques and the effectiveness of a solution and output include: readability, completeness, attractiveness, accuracy, ease of use, achievement of purpose. o Students could assess their solution, OR another student's solution, using one or more of these criteria. o Students could: ✓ *Write a Report* ✓ *Prepare a Table rating the solution against key criteria like Speed, Effort, Cost of Processing techniques (efficiency) Reliability, Relevance, Accuracy, Attractiveness, Completeness, ease of use, and achievement of purpose (effectiveness)* ✓ *As above except student may be expected to rate one or more solutions in terms of the above criteria.* ✓ *Prepare an Oral Presentation* ✓ *Conduct Peer Evaluation* ✓ *Prepare a Survey/Questionnaire for a particular audience* ✓ *The class could brainstorm some of the characteristics that make up a "good" solution.* ✓ *Student may be required to do one or more of the above, AND prepare some form of conclusion.*

9. Unit Two: Outcome One (Cont…)

9.4 Types Of Tasks That Could Be Set

- o One large Case Study that requires students to satisfy key requirements based on the Key Skills.
- o Smaller Case Studies that require students to satisfy smaller sub-components of the Outcome.
- o A combination of the above points.

10. Unit Two: Outcome Two

10.1 What Is It?

New Study Design, Unit Two, Outcome Two (page 22)

On completion of this unit the student, individually and as a team member, should be able to develop a project plan, create an electronic publication that promotes a point of view, and evaluate the project plan and the publication.

10.2 How The Key Knowledge Points Match up With The Area Of Study Points

Key Knowledge	*Area of Study Dot Point*
▪ Characteristics of electronic publications produced for different purposes, such as structure, form, and structure and meaning of text and symbols	▪ AOS 1 DP 2
▪ Functions, characteristics, capabilities and limitations of hardware and software components used to create electronic publications	▪ **AOS 3 DP 1*
▪ A problem solving methodology: analysing, designing, developing, testing, documenting, implementing and evaluating	▪ AOS 1 DP 7
▪ Sources of information on specific topics, such as mass media and electronic sources	▪ AOS 1 DP 5
▪ Factors affecting the quality of electronic publications	▪ AOS 1 DP 6
▪ Strategies for coordinating the technical and human resources required to create an electronic publication	▪ AOS 1 DP 15
▪ Social, legal and ethical considerations relating to the creation of an electronic publication	▪ **AOS 2 DP 3*
▪ Techniques for representing the design of electronic publications such as storyboards and maps	▪ AOS 1 DP 8
▪ An overview of the major steps associated with information processing: acquisition, input, validation, manipulation, storage, output, communication, retrieval and disposal	▪ AOS 1 DP 9
▪ Techniques for manipulating data and information	
▪ Formats and conventions applied to an electronic publication in order to suit its purposes	▪ AOS 1 DP 10 ▪ AOS 1 DP 12
▪ Procedures used for effectively managing the production and handling of data and information related to the creation of an electronic publication by a team	▪ AOS 1 DP 14
** Note the required knowledge for this outcome is mainly covered in Area of Study One (IT techniques: processes and management) apart from the two marked points. However the focus of all dot points is specifically 'electronic publications'. **	

10. Unit Two: Outcome Two (Cont…)

10.3 Key Skills – Sample Activities & Questions To Satisfy The Key Skills Of Outcome Two

Key Skill	**Sample Activities/Questions etc…**
• *Identify and acquire data to support the team's viewpoint to be expressed in a publication*	o Brainstorm some ideas about the type of publication that can be produced and document this – output to be determined by team, yet should be described by individual team members
• *Propose a design option and explain why the option was or was not selected by the team for development*	o Determine criteria for deciding upon best design option – consider i) Characteristics of electronic publications produced for different purposes such as structure (detailed information; aggregated information; sampled information), form (text, sound, moving & still images, statistical), structure & meaning of text & symbols (linear, non-linear, order of text, placement of icons, presentation). ii) Factors affecting quality of the elec. publication such as provision of alt. viewing options for users with special needs; time to download graphic images, currency & validity of info; ease of use, attractiveness, readability o What functions to use? ✓ *Provide a broad task in which students can choose the relevant functions they think are appropriate in creating a solution.* ✓ *Provide students with minimum requirements, which must be met to complete the task* o What formats & conventions are appropriate? ✓ *Teacher defined.* ✓ *Students brainstorm and define them as part of a classroom activity.* ✓ *See Study Design, Unit Two, Outcome Two, Key Knowledge dot point 11* ✓ *See Information Processing & Management text (Meyenn, Graham, Thatcher) p 62-63.* ✓ *See IT @ Work text pp 104-135.* o Students to individually create design options for the intended publication that are modelled/exemplified by the teacher o Present team decision-making process in minutes (particularly if the task is set so that students need to form a Committee of Management, the Secretary could document the benefits and limitations of each design *(see Types Of Tasks That Could Be Set),* table or report o Each student can explain why/why not their solution was chosen

10. Unit Two: Outcome Two (Cont…)

10.3 Key Skills – Sample Activities & Questions To Satisfy The Key Skills Of Outcome Two (cont…)

Key Skill	Sample Activities/Questions etc…
• *Prepare aspects of a project plan that identifies tasks and responsibilities of the team, timelines, indicators for monitoring progress*	o Team to use Project Management tools to allocate tasks and responsibilities – this could be a report or Task Analysis Table that includes the objective of the output, breakdown of the objective in sub-tasks (structure chart), milestones – indicators, identification of people and their responsibilities, Gantt or PERT chart for timeline o Log book maintained by each pupil where they record the team's progress in implementing the project plan (template of what to include could be teacher provided after class discussion)
• *Adjust the project plan if appropriate*	o Evaluation of project plan in student log book – commentary upon ✓ *How well the team works together* ✓ *The extent to which tasks and responsibilities are coordinated*

Key Skill	Sample Activities/Questions etc…
• *Apply techniques and procedures to manage the production and handling of the designated tasks and files, in accordance with the project plan*	o According to Study Design (Unit Two, Outcome Two, Key Knowledge dot point 12) this involves looking at methods used to back up files, and use of appropriate file naming conventions for directories/folders and files. o What Can We Get Students To Do? *(a) Backing Up* ✓ *Back up all files to floppy disk.* ✓ *Produce screen captures of backing up processes.* ✓ *Problems: Network share privileges!* *(b) Naming Conventions* ✓ *Teacher or class could define relevant naming conventions.* ✓ *Students would then be marked in accordance with their adherence to the naming conventions mentioned above* ✓ *Team to determine/record a list of guidelines/protocols to follow for naming Web pages and files and folders and show this in the Gantt chart (one team member could be made responsible for this task)*
• *Work effectively as a team member*	o Self-analysis by team members o Peer assessment by team members o Teacher assessment of students' contributions to team and project plan o Combination of the above
• *Evaluate the effectiveness of the project plan in terms of its ability to assist in coordinating the tasks and responsibilities of each team member*	o According to Study Design, Advice for Teachers, p.61, "Indicators such as the ability to coordinate the tasks and responsibilities of the team members and to respond to situations that had not been anticipated measure the effectiveness of the project plan." o Document this via report, log book, etc o Team to determine the indicators that would make the project plan successful by survey – criteria sheet that ranks indicators or observation

Key Skill	Sample Activities/Questions etc…
• *Evaluate the electronic publication in terms of the extent to which it fulfils social, legal or ethical responsibilities*	o Teacher to define Social, Legal and Ethical responsibilities of electronic publications o Brainstorm Social, Legal and Ethical responsibilities of electronic publications and document o According to Study Design, Unit Two, Outcome Two, dot point 7, some Social, Legal and Ethical considerations are ✓ *requesting permission to establish an external link for an existing website* ✓ *acknowledging copyright laws and privacy principles* ✓ *including information that does not place individuals or groups at risk, or offend sections of the community* o Students could ✓ *prepare a Table discussing the solution in terms of the key criteria - Social, Legal and Ethical responsibilities* ✓ *prepare a written report* ✓ *conduct a survey/prepare questionnaire – user testing* ✓ *respond to a series of questions set by teacher* ✓ *present a PowerPoint slide show or poster to convince 'management' about the validity of the project plan* o See Study Design, Unit Two, Outcome Two, dot point 5, for factors affecting the quality of electronic publications

10. Unit Two: Outcome Two (Cont…)

10.4 Types Of Tasks That Could Be Set

- *Note that the Outcome statement stipulates that the electronic publication "promotes a point of view"*
- One large Case Study that requires students to satisfy key requirements based on the Key Skills. Some ideas for an electronic publication are:
  - ✓ Top 5 or Worst 5 list of an area of interest to students (can be teacher or student defined)
    - ° TV shows
    - ° Pop stars
    - ° Sports stars (AFL)
    - ° Shopping strips or stores
    - ° Advertisements in media (ads can be scanned)
    - ° Neighbourhood/suburb
    - ° Computer equipment
    - ° Songs/CDs
    - ° Cosmetic brands/After shaves
  - ✓ Changes to school or PE uniform
  - ✓ Implementation of air conditioning in classrooms
    - *These promote a point of view by indicating the students' opinions about a particular topic*
    - *Consider topics that will not require a lot of research or are difficult in concept*
- Smaller Case Studies that require students to satisfy smaller sub-components of the Outcome.
- A combination of the above points.
- Overall, there must be evidence of the problem-solving methodology outlined in Unit Two, Outcome Two, Key Knowledge dot point 3:
  - Analysis – see Key Skill 1
  - Design – see Key Skill 2
  - Development – see Key Knowledge 2 and Key Skill 5
  - Testing – can use Test Table, User Testing, Page Testing, etc and should include Validation testing
  - Documenting – can be User Documentation, log book, Committee of Management reports/minutes
  - Implementation – completion of project plan
  - Evaluation – see Key Skills 7 & 8

11. Unit Two: Outcome Three

11.1 What Is It?

New Study Design, Unit Two, Outcome Three (page 24)

On completion of this unit the student should be able to design a small local area network (LAN) and describe potential economic effect for an individual or an organization resulting from the implementation of the network.

11.2 How The Key Knowledge Points Match up With The Area Of Study Points

Key Knowledge	*Area of Study Dot Point*
▪ Reasons for individuals and organisations using information systems	▪ AOS 2 DP 1
▪ Settings in which information systems are used	▪ AOS 2 DP 2
▪ Types of information systems used by individuals and organisations	▪ AOS 3 DP 2
▪ The components of an information system	▪ AOS 3 DP 3
▪ Functions, characteristics, capabilities and limitations of hardware and software components of a network	▪ AOS 3 DP 1
▪ Sources of information about the characteristics and capabilities of network topologies and network architecture such as technical references, mass media and electronic resources	▪ AOS 1 DP 5
▪ Types of networks such as local area networks and wide area networks	▪ AOS 3 DP 4
▪ An overview of types of data communications systems such as fibre optic cabling and wireless links	▪ AOS 3 DP 4
▪ An overview of network topologies, including strength and weaknesses	▪ AOS 3 DP 5
▪ An overview of network operating systems, network architecture and protocols	▪ AOS 3 DP 6
▪ Factors affecting the design of a networked information system	
▪ Economic effects on individuals and organisations resulting from the implementation of networks	▪ AOS 3 DP 7 ▪ AOS 2 DP 4
** Note this outcome draws knowledge from all three Areas of Study, in particular Area Two (IT: applications and implications) and Three (IT: information systems). **	

11. Unit Two: Outcome Three (Cont…)

11.3 Key Skills – Sample Activities & Questions To Satisfy The Key Skills Of Outcome Three

Key Skill	**Sample Activities/Questions etc…**
• *Identify a need for a network*	o Brainstorm needs for information conveyed via a network. Students can document this in some way: for example: compile a list, concept map, mind map, report, table etc o Student could interview someone about benefits and disadvantages of working in a networked environment and summarise findings o Guest speaker (office staff) could address class about benefits and disadvantages of working in a networked environment o Teacher or class to discern reasons for using information systems and define settings where they are used (see Study Design, Unit Two, Outcome Two, Key Knowledge dot points 1 & 2)
• *Outline the requirements for the network including its purpose and type*	o Teacher to define/explain purpose and types of networks o According to Study Design, Teacher Advice, p. 62, "A small LAN has two to four linked computer systems."
• *Access information from different sources (at least one electronic) to identify possible components and configurations*	o Watch a video RRR Network and complete a report/précis o Teacher to provide examples of different networks and discuss their components and functions o Provide a drawing/plans of the school office or library network and identify the components and their functions o Students could prepare a poster/animation/website that explains the parts of a network and their functions after conducting sufficient research o Site visit ✓ *See Information Processing & Management text (Meyenn, Graham, Thatcher) p 118-122.* ✓ *See IT @ Work text pp 236-244*

11. Unit Two: Outcome Three (Cont…)

11.4 Key Skills – Sample Activities & Questions To Satisfy The Key Skills Of Outcome Three (cont…)

Key Skill	Sample Activities/Questions etc…
• *Select the required components, describe their functions and explain how they assist in achieving the purpose of the network*	o Response to a series of questions set by teacher o Written report o PowerPoint slide show justifying the selections made o Oral presentation justifying the selections made with pictorial examples
• *Diagrammatically represent the network*	o Draw proposed network (layout diagram) o Teacher provides a template o Model o Software (specific or non- specific) to create the network in graphic form
• *Describe the economic effects of the implementation of the network for an individual or organisation*	o Brainstorm and document economic effects o Interview someone who works in a networked environment about the economic effects – prepare questionnaire and compile results o Internet or other research o Criteria table (see Appendix) that rates and/or discusses the criteria Time, Cost and Effort or alternatively, Costs, Revenues, Profits and Productivity (time and effort) in terms of the gains and losses o Written report o Oral presentation o PowerPoint slide show

11. Unit Two: Outcome Three (Cont…)

11.4 Types Of Tasks That Could Be Set

- o One large Case Study that requires students to satisfy key requirements based on the Key Skills.
- o Smaller Case Studies that require students to satisfy smaller sub-components of the Outcome.
- o A combination of the above points.
- o Visual presentation: PowerPoint slide show, poster in conjunction with oral presentation

12. Approaches To Teaching The New Study Design

Within each Unit, the sequencing of outcomes is flexible. Outcomes may be split into subtasks, more than one task can be completed to achieve each outcome, or a large task may be used to assess more than one outcome. It should be noted, however, that the task(s) should enable the students to demonstrate the outcome, not just discrete elements of the outcome. Teachers may choose to provide students with a selection of tasks that allow for demonstration of an outcome – in this case, teachers should ensure that tasks are of a comparable standard. The tasks should be selected from the list provided at the conclusion of each unit (pp 18 and 25). Outcomes should be completed mainly in class time and within a limited timeframe.

Factors such as software tools selected, items of hardware used, solutions developed, organisational contexts and types of information systems should be varied to take into account the availability of resources, teacher and student preferences, and teacher and student expertise. Learning activities completed by students may be varied in type and pace to allow for differences in learning styles, expertise with equipment, interest and experience.

One approach that may be followed for the teaching of Units One and Two includes working through each Area of Study, sequencing the outcomes according to the material covered.

- For Unit One, this would mean that Outcome One could be completed after working through Area of Study One, and covering small sections of Area of Studies Two and Three. Outcomes Two and Three would be sequenced after Areas of Study One, Two and Three had been covered in full, as both Outcomes draw from all three Areas of Study.
- For Unit Two, Outcomes One and Two could be completed after working through Area of Study One, and covering small sections of Areas of Study Two and Three. Outcome Three would need to be scheduled after working through all three Areas of Study.

Another approach involves all of the key knowledge and skills required for each outcome being covered by teachers prior to the students completing each outcome. One disadvantage of this is that it does not encourage students to develop knowledge links as they work through the course, or expand student application of knowledge and skills across all course content areas.

An alternative approach could be to treat each unit as an exercise in educating a user – students could develop a website that incorporates all key skills and knowledge, and outcomes could be assessed at any time, according to the progress of the student. This does, however, have implications for Outcome 2, Unit 2 that requires group work.

Table One: How The Behaviour, Attitudes And Relationships Of Users Can Be Affected By The Use Of Information Technology

In the table below, indicate how the behaviour, attitudes and relationships of individual users of a solution may be affected by the use of information technology as reflected by the criteria included down the left hand side of the attached table…

Criteria	Behaviour	Attitudes	Relationships
• The Content Of The Solution *(i.e. how could the information within the solution affect the behaviour, attitudes, and relationships of users of the solution?)*			
• The Effectiveness Of The Solution *(i.e. how could the Reliability, Accuracy, Relevancy, Readability, Attractiveness, and Ease Of Use of the Solution affect the behaviour, attitudes or relationships of users?)*			

Your Name:

Table Two: Internet Search Strategy

Search Topic:	
Keywords:	
Key Phrases:	
Synonyms:	
Possible Strings:	
Search Engines:	
Expected Search Results:	
Desired Data Type(s):	

Table Three: Sample Questions To Satisfy Key Skills Dot Point Three Of Outcome Three

Answer the questions below:

(a) What is a "metasearch"?
(b) Does your chosen Search Engine(s) provide you with a list of topics from the Subject Directory as well as www results?
(c) Does the Search Engine used provide results from more than one Search Engine?
(d) Does the Search Engine used let you refine results according to some criteria?
(e) Does your chosen Search Engine rank results?
(f) What sort of data is returned when you conduct a search? (i.e. text, images, sounds, videos, combinations of all???)
(g) Does your chosen Search Engine provide categories of hits (e.g. Websites, web pages, links etc…)?
(h) Does your chosen Search Engine suggest other Search strings to use?
(i) Does your chosen Search Engine limit the results provided in any way, or does it break results down in any way?

Table Four: Examination Of Various Internet Sources

The following table helps students examine and compare information acquired from different websites.

Criteria	**Website 1**	**Website 2**
Authority?		
Is it current?		
Cultural Context?		
Bias?		
Accessibility?		
Accuracy?		
Reliability?		
Relevance?		
Ease of Use?		
Overall Ranking?		

Table Five: A Reviewable Gantt Chart (Relevant To Unit Two: Outcome Two)

#	Task	Description	Person	M	Tu	W	Th	F	Sa	Su	Var (Day)	Reason For Variance
1	*Analysis*	✓ *Read the Case Study* ✓ *Look through the Data Selection Sheets* ✓ *Talk with client re needs*	*MS, ACA, MST, MI*									*Na*
2	*Design*	✓ *Complete A Web Map* ✓ *Complete A Story Board of Each Page to be completed* ✓ *Complete A Gantt Chart showing steps involved in producing solution*	*MS, ACA, MST, MI*								*½ Day*	*The overall design process was conducted quicker than expected. Our group worked very productively.*
Etc	*Etc*	*Etc*	*Etc*									

Code	Definition
	Expected Time To Be Taken For Relevant Task
	Actual Time Taken On Task

Table Six: How the Implementation of a network can have economic effects for an individual or organisation

In the table below, describe the economic effects of the implementation of the network for an individual or organisation as reflected by the criteria included down the left hand side of the attached table…

Criteria	**Benefits (gains)**		**Disadvantages (losses)**	
• **Costs**	***Individual***	***Organisation***	***Individual***	***Organisation***
• **Revenues**				
• **Profits**				
• **Productivity (time & effort)**				

Information Technology:

Information Processing and Management Unit 3 & 4

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UNIT 3: AREA OF STUDY 1

IT Techniques: solving information problems

This area of study focuses on the skill development of software tools, including the interaction between the software and associated hardware, emphasising techniques that could be used to efficiently and effectively produce information for a specific audience. Students will need to have a thorough knowledge of the problem solving methodology

Similarities/differences from previous study design

Most of the knowledge and skills in these areas of study are similar to the content in the 2000–2002 study design. More detail of what is required is outlined in the dot points and some additional skills and knowledge is emphasised. Noticeable additions include:

- Reasons why information problems arise.
- Characteristics of audiences.
- Problem analysis techniques.
- Interdependence between hardware and software.
- Criteria for evaluating the usefulness of software functions for particular purposes.

1. Characteristics of data and information
   - 1.1. Define data and information
   - 1.2. Data types, qualities
   - 1.3. characteristics [p1]of information
     - 1.3.1 structure
     - 1.3.2 layout and meaning
     - 1.3.3 form

2. A problem-solving methodology: analyse, design, develop, test, document, implement, and evaluate
   - 2.1. Analysis – problem definition, output requirement, required input
   - 2.2. Design – Flowchart, layout diagrams
   - 2.3. Develop – Software techniques, validations
   - 2.4. Test – Test solution, verification that correct results have been processed
   - 2.5. Document – User documentation (end-user, technical)
   - 2.6. Implementation – using the solution to produce the information (ongoing implementation/once-off)[p2]
   - 2.7. Evaluation – Types of evaluation – who, when and how

3. [p3]Reasons why information problems occur
   - 3.1. What is not working?
   - 3.2. Techniques to improve information production
   - 3.3. accessing information

4. Characteristics of audiences
   - 4.1. Who they are
   - 4.2. What they require
   - 4.3. How they require it

5. Problem analysis methods [p4]
   - 5.1. Determine output
   - 5.2. Determine input
   - 5.3. List constraints

6. Techniques for representing the design of solutions and output
   - 6.1 Flowcharts – symbols
   - 6.2 Hierarchy (structure) charts

6.3 Input-Process-Output charts
6.4 Screen/hard copy layout mock-ups
6.5 Storyboards

7. The major steps associated with information processing: acquisition, input, validation, manipulation, storage, output, communication, retrieval and disposal

8. Interdependence between hardware and software, and how this affects the ability to manipulate data
   8.1. Hardware - Compatibility
   8.2. Software – Compatibility and Version

9. Techniques for validating data
   9.1. Manual – proofreading
      9.1.1 from original
      9.1.2 second person
   9.2. Mechanical
      9.2.1 calculator
      9.2.2 machine – spell check, grammar check, [p5]input masks, formatting

10. Techniques and procedures for manipulating data and information
    10.1. Templates
    10.2. Macros
    10.3. Wizards
    10.4. Data linking capabilities
    10.5. Mail Merge
    10.6. Indexes

11. Solution attributes to be tested
    11.1. Functionality
    11.2. Presentation
    11.3. Usability
    11.4. Accessibility
    11.5. Communication of message

12. Testing techniques
    12.1. Development and implementation of test plan (internal)
    12.2. Observation and surveys of a sample of users (external)

13. Formats, and mandatory, preferred and optional conventions applied to information to meet different needs
    13.1. Define terms – mandatory, preferred and optional
    13.2. Style manuals

14. Factors affecting the effectiveness of solutions and output
    14.1. Functionality
    14.2. Presentation
    14.3. Usability
    14.4. Accessibility
    14.5. Communication of message

15. Factors affecting the value and suitability of solutions and output
    15.1. Timeliness
    15.2. Relevance
    15.3. Completeness
    15.4. Clarity
    15.5. Appropriateness for the audience (language, tone, graphics, content)

16. Procedures used for effectively managing the production and handling of data and information
    16.1. File naming convention
    16.2. File/Information storage convention
    16.3. Virus-detection software
    16.4. Regular backups

17. Criteria for evaluating the usefulness of software functions for particular purposes
    17.1 Efficiency
    17.2 Effectiveness

UNIT 3: AREA OF STUDY 2

Organisations and information

This area of study concentrates on how important information is to organizations, the procedures and equipment required when using it, protecting it, storing it and communicating it. Students also need to understand the ramifications of the ethical and legal obligations of organizations in this process.

Similarities/differences from previous study design

This area of study is extended to more specifically outline the strategies to protect the integrity of data and the application of these strategies. It also includes an additional emphasis on:

- How organizations apply legal obligations.
- Ethical considerations in the use and protection of stored data.

1. How information systems can be used to help achieve organisational goals
   1.1. Types of Organisations
      1.1.1. Goals
      1.1.2. Structures
   1.2 Types of information systems

2. Ways in which organisations and individuals use information
   2.1. Strategic, tactical and operational decisions
   2.2. Information to inform, persuade, educate or entertain users

3. Procedures and equipment for managing the storage, communication and disposal of data and information
   3.1 Directories/folders/files
   3.2 Backups
   3.3 Archives
   3.4 File transfer procedures

4. Procedures and equipment for protecting the integrity of data and the security of information
   4.1. Logical and physical methods
   4.2. Data collection processes

5. Criteria for evaluating the effectiveness of file management strategies
   5.1. Integrity of data
   5.2. Security
   5.3. Ease of retrieval
   5.4. Currency of files

6. Threats to the security of data and information stored, communicated and disposed of by organisations
   6.1. Logical and physical threats, including viruses, unauthorised access, tampering with files, failure to follow file management procedures, equipment failure/damage

7. Possible consequences of the violation of, or failure to follow, security measures
   7.1. Legal, economic and ethical

8. An overview of the legal obligations of organisations and individuals to monitor and control the flow and access of information
   8.1. Privacy Act 1988
   8.2. Privacy Amendment (Private Sector) Act 2000
   8.3. Information Privacy Act (Vic)
   8.4. Health Records Act 2001 (Vic)
   8.5. Copyright Amendment (Digital Agenda) Act 2000

9. Ethical considerations relating to the use of information systems by organisations and individuals
   9.1. Is it moral?

10. Types, roles and functions of equipment used to assist in the protection of files produced and received by organisations
    10.1. Logical and physical – including virus protection, encryption, biometrics, backup media, surveillance technology, firewalls

UNIT 3: AREA OF STUDY 3

Information Systems

This area of study focuses on information systems, the students require a solid understanding of the components of an information system – data, people, procedures and equipment.

Similarities/differences from previous study design

This area of study is very similar to the previous study design. What comprises an information system is reinforced.

1. Types of information system goals and objectives
   1.1. Why the IS exists?
   1.2. What are its goals [p6]and objectives

[p7]

2. Components of information systems, including people, equipment, procedures and data
   2.1. Types of users
   2.2. Hardware – computer components
   2.3. Software – operating, applications
   2.4. Procedures – steps to follow
   2.5. Data – integrity

3. Roles [p8]and functions of hardware and software components in an information system
   3.1 Tasks performed (function)
   3.2 Part played in the system (role)

4. Capabilities and limitations of hardware and software components
   4.1 Speed
   4.2 User friendliness
   4.3 Compatibility
   4.4 Access
   4.5 Functionality
   4.6 Capacity

UNIT 3: OUTCOME 1

Demonstrate and explain the main capabilities of a specific software tool and a related hardware component through the production of output, and evaluate the usefulness of these capabilities.

TOOLS

Choose one from DTP, web authoring, analytical and illustration graphics or multimedia. The tool must be able to enhance the presentation of information.

[p9]ASSESSMENT TASK OPTIONS

There is only one assessment task for this outcome, namely a short, practical test that includes a written response. See pages 32, 65 and 67 of the study design.

KEY SKILLS and AREAS OF STUDY

Practical test requirements

- Manipulate data by applying the appropriate software functions, and formats and conventions to produce output that demonstrates capabilities of the software.
  (Area of study 3.1.1, 3.1.8, 3.1.13, 3.1.16, 3.1.17)
  (Area of study 3.3.3, 3.3.4)

- Operate related hardware and rectify simple difficulties are they arise
  (Area of study 3.1.3, 3.1.8, 3.1.16)

Written response requirements

- Explain how the capabilities of the software and hardware components enable the output to be produced
  (Area of study 3.1.4)
  (Area of study 3.3.2, 3.3.3, 3.3.4)

- Evaluate the usefulness of these hardware and software capabilities for print and electronic output
  (Area of study 3.1.8, 3.1.14, 3.1.15, 3.1.17)

SUGGESTED STUDENT BACKGROUND

Software skills development – 2 weeks
Theory – Refer Key Knowledge page 28 study design

SUGGESTIONS FOR CREATING A TASK

Students do not have to solve a problem when completing this task – they only have to produce output that involves the use of specific software functions and associated hardware. Students are actually 'showcasing' some technical capabilities of the software and hardware. As the student has to report on the usefulness of the hardware and software for both **print and electronic** mediums, it is suggested that some obvious functions, specifically suited to one medium (for example, sound, moving images, links) be included in the output so that the student has some distinct points of reference when making their comparisons.

The task should allow students to demonstrate techniques and skills previously taught in regards to software.

Teachers could, for example, provides images that need to be manipulated for later insertion into a web page.

MARK ALLOCATION

As this outcome is only 20% of Unit 3 assessment it does not need to be onerous.

UNIT 3: OUTCOME 2

Solve an information problem, taking into account the goals and information needs of an organisation.

TOOLS

The tool used in Outcome 1 and another may be used - DTP, web authoring, analytical and illustration graphics or multimedia

ASSESSMENT TASK OPTIONS

- Information technology solution in response to a design brief **and** a
  - written report, or
  - visual presentation

See pages 32, 65, 66, 68 of study design

KEY SKILLS and AREAS OF STUDY

To achieve this outcome the student should demonstrate the ability to:

- Identify a problem and the audience
  (Area of study 3.1.2, 3.1.4, 3.1.5)
  (Area of study 3.2.1, 3.2.2)

- Describe the input and output requirements, and the constraints
  (Area of study 3.1.6, 3.1.7, 3.1.13, 3.1.14, 3.1.15)
  (Area of study 3.3.2, 3.3.4)

- Apply appropriate techniques to represent the design of the solution and output
  (Area of study 3.1.2, 3.1.16, 3.1.13)

- Apply suitable functions, formats, conventions, validation and testing techniques to manipulate data
  (Area of study 3.1.9, 3.1.10, 3.1.11, 3.1.12, 3.1.13)

- Manage the production and handling of files
  (Area of study 3.1.16)
  (Area of study 3.2.3, 3.2.4, 3.2.5, 3.2.6, 3.2.10)
  (Area of study 3.3.3, 3.3.4)

- Justify the solution and output in terms of their ability to meet the organisations goals and information needs.
  (Area of study 3.1.14, 3.1.15)
  (Area of study 3.2.1, 3.2.2)
  (Area of study 3.3.1)

SUGGESTED STUDENT BACKGROUND

Software skills development of extra tool (optional) – 2 weeks
Theory – Refer Key Knowledge page 29 study design
[p10]

SUGGESTIONS FOR CREATING AN ASSESSMENT TASK

CASE STUDY – Organisational profile and problem to be solved.
DATA – Electronic graphics and textual data – some superfluous.

SCOPE OF TASK

This outcome is worth 50% of Unit 3 and as such requires in-depth knowledge of the following areas.

- Demonstrate an understanding of an organisation and their goals, identification of problems and the audience they affect.
- They also need to show knowledge of design techniques, functions and software features including formats and conventions.
- Testing, file management and validation techniques also need to be demonstrated.
- Finally, students need to use their knowledge to justify solution.

UNIT 3: OUTCOME 3

Evaluate the effectiveness of the strategies used by an organisation to manage the storage, communication and disposal of data and information.

TOOLS
No software tool required.

ASSESSMENT TASK OPTIONS
- Test, or
- Written Report - See pages 32, 65, 66, 69 of study design

KEY SKILLS and AREAS OF STUDY
To achieve this outcome the student should demonstrate the ability to:
- Describe the goals and objectives of a specific information system
  (Area of study 3.2.1)
  (Area of study 3.3.1)

- Identify the procedures and equipment used by an organisation to manage the storage, communication and disposal of files
  (Area of study 3.2.3, 3.2.4)
  (Area of study 3.3.2, 3.3.3)

- Develop the criteria used to evaluate the effectiveness of the procedures and equipment
  (*Area of study 3.2.5, 3.2.10)*
  (Area of study 3.3.3, 3.3.4)

- Explain the strengths and weaknesses of the procedures and equipment used for storing, communicating and disposing of files
  (Area of study 3.2.5, 3.2.6, 3.2.10)
  (Area of study 3.3.3, 3.3.4)

- Evaluate the extent to which the procedures meet legal obligations
  (Area of study 3.2.8)

- Describe the consequences for the organisation and/or individuals if security measures are violated or ignored
  (Area of study 3.2.7, 3.2.8, 3.2.9)

- Make recommendations to improve the storage, communication or disposal of files produced by the organisation.
  (Area of study 3.2.3, 3.2.4, 3.2.5, 3.2.6,)
  (Area of study 3.3.1, 3.3.2, 3.3.3, 3.3.4)

SUGGESTED STUDENT BACKGROUND
Theory – Refer Key Knowledge page 30 study design

SUGGESTIONS FOR CREATING AN ASSESSMENT TASK
CASE STUDY – Description of organisation and current strategies used to manage the storage, communication and disposal of information. Questions to include:
1. Statement of problem
2. How this problem may be overcome
3. What legal & ethical considerations need to be taken into account to achieve the organizational goals?

SCOPE OF TASK
This outcome is worth 30% of Unit 3 and as such students need to demonstrate the Key Knowledge and Key Skills as outlined on page 30 of the study design.

UNIT 4: AREA OF STUDY 1

Problem solving

This area of study focuses on the use of project management (resources, cost, time) in the problem solving methodology. Students need a full understanding of user documentation for a solution and how evaluation should take place.

Similarities/differences from previous study design

This area of study includes the study of one software tool that must be either a spreadsheet or database. The content is very similar to the previous study design.

1. Characteristics of information used in organisations (1 in 2002)
   1.1. Nature (qualitative or quantitative, formal or informal)
   1.2. Structure (Detailed, aggregated and sampled)
   1.3. Form or type (Text, voice, visual or graphical)
   1.4. Sources (generated within or received from outside) and flows (circulation through organisation).

2. Types of decisions made in organizations (1 in 2002)
   2.1. Strategic and long term importance.
   2.2. Short to Medium term objectives.
   2.3. Quick decisions on day-to-day issues [operational]

3. A problem solving methodology: analyse, design, develop, test, document, implement and evaluate (6 in 2002)
   3.1. Analysis – problem definition, output requirement, required input
   3.2. Design – Flowchart, layout diagrams
   3.3. Develop – Software techniques, validations
   3.4. Test – Test solution, verification that correct results have been processed
   3.5. Document – User documentation (end-user, technical)
   3.6. Implementation –[p11] Using the solution to produce the information (ongoing implementation/once-off)
   3.7. Evaluation – Types of evaluation – who, when and how (See U3 area study 1 point 2)

4. Project management strategies for coordinating the development of a solution (7 in 2002)
   4.1. User needs (equipment, time)
   4.2. identifying tasks
   4.3. Monitoring progress

5. Problem analysis methods (2 in 2002)
   5.1. output requirements
   5.2. input requirements
   5.3. constraints

6. Techniques for representing the design of solutions and output (6 in 2002)
   6.1. Flowcharts – symbols
   6.2. Pseudocode
   6.3. Structure Charts
   6.4. Dataflow diagrams
   6.5. Layout design sheets

7. Techniques for validating data (6 in 2002)
   7.1. Manual – proofreading
      7.1.1 from original
      7.1.2 second person
   7.2. Mechanical
      7.1.3 calculator
   7.3. machine – spell check, grammar check, range check, cell protection, input masks, formatting Unit 3 area of study 1 point 9

8. Techniques for efficiently processing data (6 in 2002)
   8.1. Templates
   8.2. Macros
   8.3. Wizards
   8.4. Data linking capabilities
   8.5. Mail Merge
   8.6. Indexes – (Unit 3 area of study 1 point 10)

9. Procedures for effectively managing the production and handling of data and information (2 in 2002)
   9.1. File naming convention
   9.2. File/Information storage convention (Unit 3 area of study 1 point 16)
   9.3. regular backups
   9.4. virus protection

10. Formats and conventions applied to information to meet different needs (3 in 2002)
    10.1. Define terms – mandatory, preferred and optional
    10.2. Style manuals (Unit 3 area of study 1 point 13)

11. Solution and output attributes to be tested (5 in 2002)
    11.1. functionality
    11.2. presentation
    11.3. usability
    11.4. accessibility

12. Techniques for testing solutions and output (5 in 2002)
    12.1. expected/actual output
    12.2. relevance
    12.3. completeness
    12.4. manual checking

13. Techniques for testing user acceptance (5 in 2002)
    13.1. Impartial test user
    13.2. External user access (Unit 3 area of study 1 point 12)

14. Types of user documentation to support the ongoing use of solutions (4 in 2002)
    14.1. help menus
    14.2. quick reference cards
    14.3. user manual

15. Criteria for evaluating the efficiency of solutions and effectiveness of output (6 in 2002)
    15.1. Efficiency and effectiveness (Unit 3 area of study 1 point 17)

UNIT 4: AREA OF STUDY 2

Managing change

This area of study focuses on procedures and techniques required when changing an information system. Special attention should be shown to the development, implementation and evaluation phases of the system development life cycle.

Similarities/differences from previous study design

The focus of this area of study is very similar to the previous study design except for the use of the SDLC (Systems development Life Cycle) as a problem-solving methodology with emphasis on the phases of development, implementation and evaluation. This is different to the previous study design where analysis, design, implementation and evaluation were emphasised.

1. The systems development life cycle: analysis, design, development, implementation, evaluation (1- 8 in 2002)
   - 1.1. analysis – techniques, tools and feasibility
   - 1.2. design – methods, documentation and specifications
   - 1.3. development – software selection/development, equipment acquisition (factors affecting choice),
   - 1.4. implementation, training, documentation and conversion, personnel and procedures.
   - 1.5. evaluation – performance, error detection, methods, economic/social effects.

2. Social, economic and technological impetus for change (1 in 2002)
   - 2.1. social (government policy, community values, privacy of information)
   - 2.2. economic (desire for competitive edge, telecommuting, downsizing)
   - 2.3. technological (availability of new equipment, planned obsolescence)

3. Social, economic and technological factors affecting the feasibility of alternative hardware, software and procedural designs (4 in 2002)
   - 3.1. operational
   - 3.2. technical
   - 3.3. schedule
   - 3.4. economic
   - 3.5. personnel changes

4. Human, technical and procedural requirements to be considered when implementing changes (5 in 2002)
   - 4.1. staff training
   - 4.2. ongoing technical support
   - 4.3. acceptance by users
   - 4.4. health and safety of users

5. Methods of changing over to the new or modified information system (5 in 2002)
   - 5.1. conversion types (direct, parallel, pilot and phased)

6. Project management tools and techniques (8 in 2002)
   - 6.1. scope
   - 6.2. standards
   - 6.3. timeline
   - 6.4. develop and interpret Gantt charts and PERT charts

7. Criteria and methods for evaluating the proposed changes to information systems (6 & 7 in 2002)
   - 7.1. criteria – efficiency, effectiveness, cost, maintainability
   - 7.2. methods – observation, surveying, timing tasks, calculating costs.

UNIT 4: AREA OF STUDY 3

Information systems (networks)

This area of study concentrates on the types and characteristics of networks. Special attention should be paid to the types, typologies, operating systems and their use in achieving organizational goals.

Similarities/differences from previous study design.

This area of study is totally new from the previous study design. Content includes:

- Characteristics of networked information systems
- How networked information systems help to achieve organisational goals.

1. How information systems can be used to help achieve organisational goals (1 in 2002)
   1.1. compare and evaluate organisational and system goals

2. Types of networks and data communication systems and their specifications (new)
   2.1. LANs, WANs, WWW etc.
   2.2. protocols and transport (TCPIP)
   2.3. transmission media (Modem, ISDN, cable etc.)

3. Network topologies (new)
   3.1. bus
   3.2. star

4. Network operating systems, and network architecture and components (new)
   4.1. Network Operating systems - NT, NOVEL, Mac OS
   4.2. architecture – design of how to connect hardware/software
   4.3. components – hubs, routers, wireless connections, servers.

UNIT 4: OUTCOME 1

Propose and apply organization and processing strategies to produce an ongoing solution that meets the decision-making needs of an organisation.

TOOLS
Choose from:
- Database
- Spreadsheet

ASSESSMENT TASK OPTIONS
- Information technology solution (including user documentation) in response to a design brief (40 marks), and
- Project management report that includes a management plan, record of progress and an error log (20 marks)

While this outcome is worth 60 marks, there are two assessment tasks. See pages 38 and 70 of study design.

KEY SKILLS and AREAS OF STUDY
To achieve this outcome the student should demonstrate the ability to:
- identify a problem
  (Area of study 4.1.3, 4.1.3)

- describe the input and output requirements and constraints
  (Area of study 4.1.3)

- apply techniques to represent the solution
  (Area of study 4.1.6)

- prepare a project management plan that identifies tasks, timelines, indicators for monitoring progress
  (Area of study 4.1.4)

- apply suitable functions, formats, conventions, data validation and testing techniques to efficiently process data and produce effective output
  (Area of study 4.1.1, 4.1.7, 4.1.8, 4.1.9, 4.1.10, 4.1.11, 4.1.12)

- record the progress of creating the solution (and output, where appropriate, including an error log
  (Area of study 4.1.4)

- prepare user documentation that explains how to use the solution and output
  (Area of study 4.1.14)

- manage the production and handling of files
  (Area of study 4.1.9)

- evaluate the solution and output in terms of ability to meet the decision-making needs of the organisation
  (Area of study 4.1.4, 4.1.2, 4.1.13, 4.1.15)

SUGGESTED STUDENT BACKGROUND
Theory – refer key knowledge page 35 study design.
Areas of study – 1

SUGGESTIONS FOR CREATING A TASK
Case study – must include an organisational profile and a problem to be solved. Data (graphical, numerical and textual) can be given. (see page 70 and 71 of the study design)

SCOPE OF TASK

This outcome is worth 60% of unit 4 and as such students need to demonstrate the key knowledge as outlined on page 35 of the study design. It is divided into two parts.

Part A
Produce a solution which includes:

- User documentation for the solution
- Annotated solution showing how it meets the organizations decision making needs.

Part B
Students need to produce a Project Management report that includes:

- Management plan
- Record of progress
- Error log

UNIT 4: OUTCOME 2

Formulate and justify strategies for developing, implementing and evaluating a networked information system in response to a social, economic or technological impetus for change.

TOOLS
No software tools required.

ASSESSMENT TASK OPTIONS
- A written report, or
- a test or
- a visual presentation.

(See page 71 of study design)

KEY SKILLS and AREAS OF STUDY:
To achieve this outcome the student should be able to demonstrate the ability to:

- State the objectives of a new information system and how they relate to the social, economic or technological impetus for change
  (Area of study 4.2.2, 4.2.3)
  (Area of study 4.3.1, 4.3.2)

- Develop criteria for selecting the computer system hardware and software
  (Area of study 4.2.1)
  (Area of study 4.3.2, 4.3.3, 4.3.4)

- Develop criteria for selecting the network hardware and software
  (Area of study 4.2.1, 4.2.4)
  (Area of study 4.3.2, 4.3.3, 4.3.4.)

- Propose any changes to existing procedures
  (Area of study 4.2.4)

- Explain the human technical and procedural issues to be considered when implementing change
  (Area of study 4.2.4)

- Justify a method for changing over to the new or modified system, taking into account the human and technical issues and any changes to procedures
  (Area of study 4.2.4, 4.2.5)

- Identify the key tasks associated with the implementation of the new or modified, such as training, documentation, evaluation criteria, ergonomic requirements
  (Area of study 4.2.6)

- Develop a project management plan to coordinate the implementation of the new or modified system, which includes tasks, timelines, allocation of resources
  (Area of study 4.2.6)

- Explain methods for evaluating the success of managing the implementation of the new of modified system
  (Area of study 4.2.7)
  (Area of study 4.3.1)

- Evaluate the success of the information system in achieving its objectives
  (Area of study 4.2.7)
  (Area of study 4.3.1)

SUGGESTED STUDENT BACKGROUND
Theory – refer key knowledge page 36 study design.
Areas of study – 2 & 3

SUGGESTIONS FOR CREATING A TASK
Case study – organisational and information system profile in order to formulate and justify strategies in response to changes.

SCOPE OF TASK
This outcome is worth 40% of unit 4 and as such students need to demonstrate the key knowledge as outlined on page 36 of the study design

Students need to respond to questions, which will show their understanding of managing change to a new or improved networked information system.

	WEEK	*KEY KNOWLEDGE AND SKILLS*	*ASSESSMENT*
1		**Organisations and information** How information systems can be used to help achieve organisational goals Ways in which organisations and individuals use information Procedures and equipment for managing the storage, communication and disposal of data and information	
2		**IT techniques: solving information problems** Characteristics of data and information A problem-solving methodology: analyse, design, develop, test, document, implement, and evaluate Techniques for representing the design of solutions and output	
3		**IT techniques: solving information problems** Techniques and procedures for manipulating data and information Formats, and mandatory, preferred and optional conventions applied to information to meet different needs	
4		**Information systems** Types of information system goals and objectives Capabilities and limitations of hardware and software components Roles and functions of hardware and software components in an information system Review Criteria – Outcome 1 Practice SAC using hardware component and related software	
5		**IT techniques: solving information problems** Interdependence between hardware and software, and how this affects the ability to manipulate data **OUTCOME 1 – 20%** 1 lesson Folio work using software for Outcome 2	**Outcome 1**
6		Folio work using software for Outcome 2	
7		**IT techniques: solving information problems** The major steps associated with information processing: acquisition, input, validation, manipulation, storage, output, communication, retrieval and disposal Techniques for validating data	
8		**IT techniques: solving information problems** Solution attributes to be tested Testing techniques Factors affecting the effectiveness of solutions and output Factors affecting the value and suitability of solutions and output Procedures used for effectively managing the production and handling of data and information Criteria for evaluating the usefulness of software functions for particular purposes	

9		Review Criteria – Outcome 2 Practice SAC	
10		Complete Practice SAC **OUTCOME 2 – 50%** Duration 300 minutes	**Outcome 2**
11		**OUTCOME 2 – 50%**	**Outcome 2**
		TERM ONE BREAK	
1		**IT techniques: solving information problems** Problems Reasons why information problems arise Characteristics of audiences Problem analysis techniques **Information systems** Components of information systems including people, equipment, procedures and data	
2		**Organisations and information** Procedures and equipment for protecting the integrity of data and the security of information Criteria for evaluating the effectiveness of file management strategies Threats to the security of data and information stored, communicated and disposed of by organizations Possible consequences of the violation of, or failure to follow, security measures	
3		**Organisations and information** An overview of the legal obligations of organisations and individuals to monitor and control the flow and access of information Ethical considerations relating to the use of information systems by organisations and individuals	
4		**Organisations and information** Evaluating security procedures and equipment Types, roles and functions of equipment used to assist in the protection of files produced and received by organisations	
5		Review Criteria – Outcome 3 **Practice SAC**	
6		**OUTCOME 3 – 30%** Duration 60 minutes	**OUTCOME 3**
7		**GAT WEEK**	

	WEEK	*KEY KNOWLEDGE AND SKILLS*	*ASSESSMENT*
8		**Problem solving** Characteristics of information used in organisations Types of decisions made in organizations A problem solving methodology	
9		**Problem solving** Project management strategies for coordinating the development of a solution Problem analysis strategies Techniques for representing the design of solutions and output	
		TERM TWO BREAK	
1		**Problem solving** Techniques for validating data Techniques for efficiently processing data Procedures for effectively managing the production and handling of data and information Formats and conventions applied to information to meet different needs	
2		**Problem solving** Solution and output attributes to be tested Techniques for testing solutions and output Techniques for testing user acceptance Types of user documentation to support the ongoing use of solutions Criteria for evaluating the efficiency of solutions and effectiveness of output	
3		Review Criteria – Outcome 1 Practice SAC	
4		**OUTCOME 1 – 60%** Duration 360-420 minutes	**OUTCOME 1**
5		**OUTCOME 1 – 60%** Duration 360-420 minutes **Managing change** The systems development life cycle: analysis, design, development, implementation, evaluation Social, economic and technological impetus for change Social, economic and technological factors affecting the feasibility of alternative hardware, software and procedural designs	**OUTCOME 1**
6		**Managing change** Human, technical and procedural requirements to be considered when implementing changes Methods of changing over to the new or modified	

		information system Project management tools and techniques Criteria and methods for evaluating the proposed changes to information systems	
7		**Managing change** Human, technical and procedural requirements to be considered when implementing changes Methods of changing over to the new or modified information system Project management tools and techniques Criteria and methods for evaluating the proposed changes to information systems	
8		**Information Systems (networks)** How information systems can be used to help achieve organisational goals Types of networks and data communication systems and their specifications Network topologies Network operating systems, and network architecture and components	
9		**OUTCOME 2 – 40%** Duration 60-120 minutes	**OUTCOME 2**
		TERM THREE BREAK	**Practice exams**
1		Revision and Exam Preparation	
2		Revision and Exam Preparation	
3		Revision and Exam Preparation	
4		**Exams**	
5		**Exams**	
6		**Monday 10th November IPM Exam 3.00pm-5.15pm**	
7		**Exams**	

Page: 2
[p1]As per study design
Page: 2
[p2]These relate more to the implementation stage of the systems development life cycle.
Page: 2
[p3]Study design starts at ‘reasons’
Page: 2
[p4]study design
Page: 3
[p5]unlikely for outcome 2 – better suited to Unit 4
Page: 7
[p6]Have changed this – think that the introduction of another term (aim) may confuse some people
Page: 7
[p7]Have changed this because I think that introducing another term may confuse some peopel
Page: 7
[p8]this dot point had been left out
Page: 8
[p9]What is written here is the assessment task options.
Page: 9
[p10]Already covered in key skills
Page: 11
[p11]This definition relates to the systems development life cycle

Information Technology:

Information Systems Unit 3 & 4

VICTORIAN

INFORMATION TECHNOLOGY

VITTA

TEACHERS ASSOCIATION

JUNE 2002 – www.VITTA.org.au

Approved programming languages for 2003 – Information Systems

Students will use one programming language from the accompanying list, to develop purpose-designed software. In the development of this software, students should be able to:

- Develop a graphical user interface (GUI) for use either within an organisation or external to it
- Construct and use data structures, for example arrays, strings, sets, lists, tables, records and stacks
- Design, construct and use files to store and retrieve data
- Design and apply data-validation techniques
- Use program control structures: selection, iteration and sequencing.

The purpose-designed software will entail the use of objects, methods and their properties, and event-driven programming.

List of approved programming languages

Delphi
Visual Basic (not Visual Basic for Applications) /REALbasic
Visual C++
OpenScript
Hypertalk
Visual Dbase
Visual FoxPro
Javascript, VBScript, Jscript
Visual J, Java
Perl, PHP, Python

Teachers of Information Systems should note that the list of approved programming languages is revised each year and is published in the VCE Bulletin.

VCE Bulletin, No. 177 June 2002.

UNIT 3: AREA OF STUDY 1

Information systems and networks

What should be covered in this area of study?

This area of study requires students to develop an understanding of computer networks, including the terms used to describe the components of the network and the relationship between the different components. This includes the human element – that is, the people and procedures that are also apart of an information system. Specifically:

- Types of information systems used by individuals and organisations

Students are expected to understand the different types of information systems that may be found in a range of settings. This should include those of large organisations and those that would be found in small organisations as well. This would include such systems as Management Information Systems, Financial Information Systems, Decisions Support Systems that would be found in larger organisations, as well as simpler information systems that would be found in smaller organisations. (Such as the computer systems that are used by small organisations to track GST obligations). The study design states that students must examine transaction processing and expert systems as well.

Such systems would be investigated in a generic manner, rather than a detailed examination of one organisation's particular information system structure. It would be expected that students have an understanding of similarities and differences between the different systems and the components that are integral to the successful functioning of them.

- Purposes of using information systems in a range of settings

As well as developing an understanding of the types of information systems found in organisations, students are also expected to develop an understanding of why these systems are used – this is usually expressed through their goals and objectives. The link between the purpose of an information system and the actual manner in which the system is designed and constructed is an important one. Students are expected to understand this relationship and the impact that this has on the design and success of an information system.

- Roles and functions of the components of an information system (including people, equipment, procedures and data)

All of the major components of major components (people, equipment, procedures and data) of information systems should be investigated, and students are expected to understand the relationship between the different components. The specific hardware devices and software tool investigated as part of the equipment component will be very dependent on the types of information systems studied. In larger systems the equipment component may be defined as a switch, hub or fileserver; while in a single computer system, it may be the manner in which the peripheral devices interact.

It must be noted, though, that the equipment (hardware and software) component is only one aspect of the information system. The roles of the people who use the system, and the procedures that are used to ensure the smooth operation must also be examined, as should the way in which data is handled by the system.

These first three dot points are closely related. It is expected that they be taught in conjunction with each other. That is, an information system is examined and investigated in regards to each of these dot points. Students should, however, be exposed to a number of different types of information systems, to ensure that they are aware of a range of different settings and the manner in which the setting of an information system can impact each of these areas.

- Computer architecture

It is expected that students are familiar with the architecture of a typical computer system – such as the major components and the manner in which they connect with each other. It is expected that students will be fluent in the terms that are used to describe the components of computer systems. This includes specific terms (such as "USB", "Parallel Port", "Motherboard" etc) as well as more general terms (such as "protocols", "peripheral devices", "broadband" etc.).

- Types of networks and the types and capabilities of network topologies

A range of typical networks should be investigated. Different network topologies (star, bus) should be investigated in the context of their comparative strengths and weaknesses and how this affects their suitability for various applications.

- Network operating systems, network architecture and components

A range of network operating systems should be examined, and the strengths and weaknesses of each compared. Included in this would be an examination of how network operating systems differ from the operating systems of a desktop computer (in particularly in the functions they need to preform). The components of the networks should also be investigated. Students should be familiar with both the specific item terms (such as "TCP/IP", "CAT5" etc.) and generic networking terms (such as "fileserver", "backbone" etc). It is assumed that students would have a sound understanding of the internal working (and terms) of a computer at this point.

- Tools to represent the components of a networked information system and their relationship between the components.

A range of alternatives for the representation of networks should be examined, such as block diagrams, and students should become adept at using these tools to accurately depict a network and the relationship of the different components.

These last four dot points are closely related and would be taught together. An approach would be to examine an existing network and investigate the way in which the network is constructed and documented. This could be compared to another network and the differences discussed. It is important that students are given experience in both reading and constructing network diagrams – as this is an integral skill in completing Outcome 1.

Similarities and differences

This is a relatively new area of study – although there are a number of areas where some aspects of the previous course will still be of use. In the old course, it was expected that students have an understanding of the technical terms that are employed in Information Systems design and construction – this remains the case. It is built upon – students are now expected to have a much broader understanding of networking and the terms that are associated with it.

What stays the same?

Students are still expected to have an understanding of the basic architecture of a computer system. They will also be expected to be familiar with networking concepts and terminology.

What changes?

The depth of knowledge is probably the biggest single change from the old course. Students are expected to become fluent with the terms that are associated with this technology and become adept at describing the relationship between the different components of an information system. In order to understand these

relationships, students must have a good knowledge of the components and the manner in which they operate.

What is new?

Constructing representations of networks is a new element in the course. Students are expected to be able to construct diagrams that accurately represent the structure of a network and the relationship between the different components. In order to do this, students will require more than just a cursory knowledge of the elements of an information system – they will need to know what each element does, and how it differs from similar devices (and how that impacts on the design of a network). An example of this would be the differences between a hub and a switch.

UNIT 3: AREA OF STUDY 2

Information systems engineering (analysis and design)

What should be covered in this area of study?

Students are unlikely to have encountered the concept of the systems development life cycle in their previous study of VCE Information Technology. This area of study focuses on the main phases associated with the systems development life cycle; analysis, design, development, implementation and evaluation. In Unit 3, students study in depth the first three phases – analysis, design and development and explore the use of the systems development life cycle as a problem-solving methodology. In this area of study, 2, Information systems engineering (analysis and design) students focus on the analysis and design phases and in area of study, 3, Software development students will focus on the development phase.

- The systems development life cycle, including analysis, design, development, implementation and evaluation.

The systems development life cycle is a method for developing information systems. Students are expected to understand the five main stages of the systems development life cycle. Each stage has several components; for example, the development stage includes programming: coding including internal documentation, debugging, testing, documenting; and acquiring equipment: selection, acquisition (purchase or lease), testing.

- Economic, social and technical factors prompting change within organisations

The economic cost of implementing change is always a major factor to be balanced against the benefit of change within an organisation. Technical factors require the information system meet the technical requirements of a users' situation, for example, reliability, speed of the system, capacity of the system, type and amount of data, physical conditions, etc. may all be factors prompting change. All information systems exist within a social context and the user is the main focus of this context. The information system needs to suit the requirements of the user who may need information in a certain format or have other special needs. Social factors of the information system context may also prompt change within the organisation.

- Information system goals and objectives

Students are expected to be able to identify information system goals and objectives. An information system goal is a broadly stated purpose. An objective, on the other hand, is a more specific and concrete statement of purpose. An objective differs from a goal in that it is more specific and immediate and includes a measurable outcome. Students should not confuse organisational goals with information system goals. An example of an organisational goal of a bank, for example, may be to return a profit and pay a dividend to the shareholders. Organisational goals are therefore more general than information system goals and objectives.
Examples of information system goals may be the following:

  - decentralise company billing to improve the processing of computer bills and reduce outstanding accounts
  - tie together budgeting with accounts payable to improve the planning and control of company expenditure

Mini case studies or scenarios should be used to provide students with practise in writing information system goals and objectives.

- Roles and functions of the components of information systems

Students need to be familiar with the components of an information system. The components include people, equipment, procedures and data. An information system consists of computer hardware and software, personnel who operate and use the system, data (inputs to the system) that is processed into

information (outputs from the system) and the procedures used by the personnel to direct the processing within the system. The "role" of a component of an information system is the part played by that component; for example, the role of a network administrator is to keep the system functioning; the role of a scanner is to read documents and convert them into digital form that a computer can process. The "functions" of an information system component are the tasks it performs eg. the actual tasks that are performed by the network administrator.

- Primary and secondary data sources and data acquisition methods to conduct an analysis

Students are expected to be familiar with primary and secondary data sources and data acquisition methods to conduct an analysis, including direct observation, surveys, interviews, system and program documentation and logs.

- Types of data and a range of equipment appropriate for inputting, processing, storing, accessing, and outputting data and information

Students should be aware of the:
Types of input data – common types of data are text, sounds, images, video and movement and selection.
Types of output data – common types of data are text, sounds, images and video.

Students should be familiar with the steps of information processing – input steps, (acquisition, input, validation) processing and storage steps (processing, storage, retrieval) output steps (output, communication and disposal.)

Students should have an understanding of the range of software and hardware available for inputting, processing, storing, accessing, and outputting data and information. Students should be able to recommend suitable software and hardware for a range of situations suitable for the different stages of information processing.

- Existing information system context, processes and data structures

Students are required to understand the existing information system context, processes and data structures, including the input and output requirements of the system, details of each process, data stores and data structures

- Logical design techniques for documenting the results of an analysis

Students are required to be familiar with and understand the logical design techniques for documenting the results of an analysis. Students should be able to competently use the design tools, including context diagrams, data flow diagrams (DFDs) and data dictionaries.

To reinforce these techniques students should be provided with a series of small case studies to practise using these design tools.

- Input, processing and output specifications to meet information system goals and objectives

The processing of data into information involves the use of hardware and software, the people who direct and initiate the processing, and the procedures that are performed in the production or manipulation process. The reasons for selecting specific hardware and software can be explained in terms of efficiency and effectiveness.

Students need to design a solution that addresses the input, processing and output specifications of the information and fulfils the goals and objectives of the information system.

- Functions and characteristics of hardware and software components options and procedures available to meet the required specifications

Students need to understand the range of functions and characteristics of hardware and software options when designing a solution.

***Functions** – The tasks performed by information system components eg. operating system software – does the operating system software control logging on.

***Characteristics** – The identifying elements of a piece of hardware or software; for example, MS Word can process words, format documents for online use, produce diagrams.

* Note: these definitions are the ones that appear in the Glossary of the study design (pp 82–86)

Procedures are performed in the production or manipulation process. Students also need to design procedures that consider the impact of the proposed change on procedures for controlling data flow through the system.

- Technical, operational and economic criteria for evaluating the feasibility of alternative design options to achieve the information system goals and objectives

Technical feasibility concentrates on the characteristics of the required hardware and software, for example, can the equipment expand with the organisation's future needs, the reliability of the hardware and software, whether the organisation has the resources to operate the system. Operational feasibility determines whether a project can be put into place, how will people be affected and whether there will be unintentional effects that may occur as a consequence of change. Legal and ethical issues are addressed, effects on employment as a result of this new system are examined, the implementation schedules (both time and cost) of development are critical and the support of management is established. Economic feasibility establishes whether the system is a good investment for he organisation. A system is deemed to be economically feasible if the expected benefits (both financial and non-financial) are more important than the estimated costs of installing, planning, purchasing and building it. Some of the costs evaluated include personnel costs, software licensing, training and development of software that is not off-the-shelf, the cost of hardware, etc.

- Physical design specifications

Students need to understand the implications of physical design specifications, including the output and input devices, format, size and use of files, software capabilities, control procedures, backup procedures, security procedures and virus protection

- Tools to represent the relationships between information system components

Students need to be experienced with the range of tools that can be used to represent the relationships between information system components, including data flow diagrams (level 1), hierarchy charts, structure charts and system flow charts

- Criteria for evaluating the performance of proposed information systems

Students need to be familiar with applying criteria for evaluating the performance of proposed information systems, including efficiency, effectiveness, cost, maintainability.

The logical design of the proposed information system specifies a list of key criteria, or targets, that the new system must achieve for the problem to be solved. The key criteria are the performance aims and objectives of the new system and list other factors, (operational, technical and economic) that which also need to be considered.

Students are required to be especially familiar with the following criteria for evaluating the performance of a proposed information system.

Efficiency – An information system is efficient when it achieves its purpose with the least time, cost or effort.

Effectiveness – An information system is effective when it achieves its purpose. It is measured in terms of completeness, attractiveness, clarity, accuracy, relevance and ease of use.

Cost – This criterion is often a very important consideration when choosing hardware or software. The cost involved in the purchase can help in formulating a decision to purchase that item or not. If a hardware or software component is too expensive, then other alternative components are looked into to see if the cost can be reduced.

Maintainability – This criterion is important when choosing hardware and software. Something that can be fixed or modified to suit an organisation is necessary as this saves further costs later on. The defects of an information system need to be able to be removed to allow the information system to evolve with the needs of the organisation. In selecting components for an information system, it is important to choose components that can be maintained and fixed easily and quickly by people in the organisation, or by local suppliers that can provide a rapid service.

What stays the same?

This area of study is a combination of the two previous Areas of Study 1, Information systems engineering and 2, Information systems: applications and effects in the old study design. In the new study design these have combined into one large area of study, Areas of Study 2, Information systems engineering (analysis and design).

What changes?

In the old study design 70% of class time for Unit 3 was required to spent on the learning activities and School Assessed Coursework associated with these areas of study. In the new study design only 50% of class time should be spent on the learning activities and the School Assessed Coursework for the Information systems engineering (analysis and design) area of study.

In the new study, students will deal with the first two stages of the SDLC, analysis and design, together, in this area of study, rather than separately as they did in the old study design.

The depth of knowledge required of the SDLC appears to be very detailed in the new study design. Students are required to have an overall knowledge of the five phases and a detailed knowledge of the phases of analysis and design. They need to be able to apply these phases skilfully to a case study and develop a solution.

Students also need to be able to define information system goals and objectives more effectively in the new study design and distinguish these clearly from the organisational aims. This is a separate point in the new study design.

Students will also need to be very expert with their use of the tools to document an analysis and design of an information system

What is new?

Essentially, there is very little that is new in this Area of Study. Students are required to have the same depth of knowledge as that specified in the previous study design.

There is more emphasis on criteria for evaluating the performance of proposed information systems in the new study design (a separate dot point). Therefore, a tool such as a feasibility analysis matrix for enabling various alternatives and their strengths and weaknesses to be evaluated against the proposed aims and objectives of the new system can be taught and used.

What should be covered in these areas of study?

The key focus in these two areas of study is the stages of software development. Students need to have a detailed understanding of the six stages by the end of Unit 4. These stages are: analysis, design, development, testing, documentation and evaluation. Students should have a range of tools and techniques that they are use to develop and document the development of purpose written software.

It is through these areas of study that students develop an understanding of how a computer handles, structures, stores and processes data. Students should also consider factors associated with the implementation of any software produced, including the need for appropriate documentation. Students consider the process of software development from the prospective of the programmer and what she/her needs to do to meet legal obligations and ethical responsibilities.

Similarities and differences

Most of the content specified in these areas of study is similar to the content in the 2000–2002 study design with the exception of the following dot points:

AS 3.3.7 legal obligations of programmers, and ethical considerations regarding the development of programming solutions
&
AS 4.1.11 causes of conflict between developers of purpose-design software and end-users.

Consider
"Many business people are surprised to learn that they do not own the program that they have paid to have written for them! This is because, without an agreement to the contrary, the Copyright Act 1968 (the "Act") makes the author of the program the owner of the copyright in it, not the person who paid for it

Before the program is written, state in writing that you are to own the copyright; a requirement of the Act. For good measure, also state that you own copyright in the specification."

http://www.pictonwarlow.com.au/online_resources/technology/5_steps_to_avoid_misery_2.html

A good article/case study on legalities of who owns the source code!

http://www.artslaw.com.au/reference/cavmulti992/

UNIT 4: AREA OF STUDY 2

Information systems engineering (development, implement and evaluation)

What should be covered in this area of study?

This area of study follows on from Unit 3, area of study, 2, Information systems engineering (analysis and design) and Unit 3, area of study, 3, Software development, with particular emphasis on the development, implementation and evaluation phases of the SDLC.

- The system development life cycle

Students are expected to understand the phases of SDLC. The phases explored in depth are development (Outcome 1) and implementation and evaluation (Outcome 2). Students should become familiar with the activities that occur within each of these phases and the methodologies involved.

- Factors influencing the acquisition of hardware and software

Following on from factors promoting changes and feasibility issues from Unit 3, students are to consider a range of technical, human, procedural, economic and management factors that effect the acquisition of hardware and software.

Case studies (scenarios), guest speakers and magazine articles could be used to provide students with a range of factors. Students should compare alternatives against possible organisational constraints or factors. Students should consider how organisation might compare alternatives and ultimately make a choice of alternatives. Methods such as benchmarking, focus groups, feasibility matrix etc

- System Testing

Testing in the previous study design tended to focus on program testing, the new one requires students to consider how an information system will be tested, including equipment testing, processing and system management testing and acceptance testing.

- Implementation methods

Students should have a detailed understanding of the pilot, phased, direct and parallel conversion/changeover methods.

- Documentation, training and security implementation considerations

There is a expectation that students have a more detailed understanding of documentation (Outcome 1 Unit 4, 15% & Outcome 2), training methods and requirements, and security procedures and methodology.

- Project Management

In the previous study design students need to have an overview of PM, the new study requires a more detailed knowledge, including a working knowledge of Pert and Gantt charts.

- Criteria and strategies for evaluating performance

This requires students to not only consider how to evaluate but what criteria it should be evaluated against.

What stays the same?

This area of study is very similar to Area of Study 3 in the previous study design.

What changes?
The percentage of time spent on this area of study is the same as in the previous study design. 40% of class time for Unit 4 is required to be spent on the learning activities and School Assessed Coursework associated with these areas of study.

What is new?
Essentially, there is very little that is new in this Area of Study. Students are required to have the similar depth of knowledge as that specified in the previous study design.

However, the Outcome associated with this Area of Study, Unit 4 Outcome 2 details more explicitly what must be included. There is more emphasis on factors that influence acquisition, testing techniques, project management and evaluation criteria and strategies.

UNIT 4: AREA OF STUDY 3

Information systems: networks

What should be covered in this area of study?

This area of study is closely related to Unit 3 AoS 1 – Information systems and networks. Much of the theory relating to hardware, software and topology of networks will already have been covered in Unit 3. This area of study seeks to place a global context onto the knowledge the students have gained in Unit 3.

- Types and capabilities of networks and network topologies

A range of typical networks should be investigated. Different network topologies (star, bus) should be investigated in the context of their comparative strengths and weaknesses and how this affects their suitability for various applications. This should build on the knowledge gained in Unit 3 and explore them in a global context.

- Network operating systems

Network operating systems should be investigated, once again, building on the knowledge gained from Unit 3. This unit should place a global context onto the study of network operating systems – as such, it is appropriate to focus on operating systems that would be found in global (rather than local) networks. Example could include Unix, Linux etc.

- Purposes for organisations using networked information systems in a global environment

This requires an examination of the reasons why information systems are employed in a global setting. This should investigate the reasons why global information systems are required and the different settings that they may be found in. (For example – government, military and private company global information systems). Issues that would be investigated include the speed of the systems and the different data handling capabilities required for different applications.

- Types of problems associated with using networked information systems in a global environment

An examination of the problems associated with global networks should include the obvious issues, such as security and data access. It should be noted that the problems do not have to be just technical ones. . Many issues that were previously identified (in unit 3) as problems associated with local networks could also be examined in a global context. Others to consider include incompatible file formats, different legislations, English as the main language, low bandwidth.

- Advantages and disadvantages for organisations and society in using information systems in a global environment

There is a wide range of issues that could be investigated – a balanced selection of issues that highlight both advantages and disadvantages associated with information systems should be investigated. Issues that are investigated need to be done so in a global context, and as with the previous dot point, could be approached with reference to the issues identified in unit 3 with local networks.

This area of study is best approached in two sections – the actual hardware used, and the issues associated with global networks. The hardware and network topology of global networks builds on the knowledge that has been established in unit 3, but places this in a global context.

Problems, advantages and disadvantages for organisations and society in using information systems in a global environment may be approached as a single topic using topical case studies to investigate issues that are of relevance. The study design lists a range of advantages and disadvantages – select some of these to investigate.

What stays the same?

As with U3AoS1, this is a relatively new area of study. Consequently the amount of carry over from the old study design is somewhat limited. Much of the material that will need to be covered in this area of study will need to be revised on a year-to-year basis – reflecting the changing nature of the technology of global networks. Currently it is assumed that students have a knowledge of networking terminology, this requirement remains in the new study design.

What changes?

The depth of knowledge that the students are expected to develop in their understanding of networks is much greater than the current course requires. Student will now be required to demonstrate an understanding of more technical terms and components of networks than was previously the case. However, this does not mean that students must become fully conversant with every term that is in use, rather, by the end of the course they should have an understanding of the major components of networks and the manner in which they interact. It is important that this is placed in a global context. (see following)

What is new?

The study design requires the investigation of networked environments be done in a global context. This is a new requirement. Teachers must ensure that when the topic of networked information systems is covered, that it is done so in the context of global information systems. There are a range of issues that are common to local area networks and global networks – teachers must ensure that students are aware of the differences that global contexts can place onto these issues.

Unit 3: Outcome 1

To explain the functions of, and the relationships between, the components of a networked information system used in an organisation.

OVERVIEW

Student are to be provided with a written scenario that could typically include an information system, a profile of the hardware used in the system, as well as the users and the manner in which the system functions. Students are to respond to the scenario in either:

- a poster format or
- a presentation file.

If a presentation file were the selected task option, then it would be assumed that the students have a working knowledge of that software before beginning this outcome (and assessment task). If students respond in poster format, it can either be hand-prepared or created using a software tool. Likewise, if the latter is chosen, it is assumed that students will have a working knowledge of any software that is to be used.

If the poster option were selected, it would be expected that the students would be required to produce a poster that accurately represents the system and those that interact with it. Care should be made when assessing this – while the actual presentation is important, the content the poster contains is more important by far.

The presentation file option probably provides greater scope for better students to demonstrate their superior understanding of the concepts that are assessed in this outcome. A presentation file could consist of a powerpoint presentation, hyperstudio, inspiration or any other multimedia application. It could also include a hyper-linked word document. This option would allow students to create diagram of the network that links to more detailed information on each component. This would allow students to complete a more detailed summary of the scenario provided.

KEY SKILLS AND AREAS OF STUDY

Key Skills	Area of Study
• Identify the purpose of an information system and the type of network described in a given written scenario	3.1.1, 3.1.2, 3.1.3
• Represent visually the following components of a networked information system and their relationships: the equipment; key sources of data used in the system and the people involved with the system	3.1.4, 3.1.5, 3.1.6
• Annotate the components to indicate the roles of the people involved with the system	
• Analyse the operations of an information system in order to explain why the identified topology was chosen and comment on its appropriateness	3.1.8
	3.1.7

SUGGESTED STUDENT BACKGROUND

Before assessing this outcome, students will need to have completed the theory associated with Unit 3, Area of Study 1. It is assumed that students will have a knowledge of network topologies, components of an information system and methods that are used to represent them.

In order to complete this outcome, students would need to be able to analyse a written scenario, and from this, be able to identify the relationships between the various elements of the information systems. They need to be able to both interpret and construct diagrams to represent the network, and be able to explain the purpose and functions of the components.

TIMEFRAME FOR ASSESSMENT

This outcome represents 20% of the assessment for Unit 3. As such it, and the preparation theory associated with it, should take around 3-4 weeks of the course time to complete.

CREATING AN ASSESSMENT TASK

When designing a task for this outcome, teachers will need to provide a case study / scenario for the students to analyse. This case study should contain sufficient detail for the students to be able to identify the people who use the system and the manner in which they do so. In creating the task, teachers should avoid providing information in a manner that is to similar to the analysis that the students are required to produce as the solution – one of the key skills being assessed in this outcome is the students ability to analyse the information contained within the scenario, and if the data that is presented is done so in a manner that too closely follows the anticipated solution, it would be possible for students to simply regurgitate the scenario ad nauseum rather that providing their own analysis. Accordingly, students should not be presented with a diagrammatical representation of the actual system – a written description that they can transfer into a diagrammatical representation. If desired, it may be appropriate to supply a diagrammatical representation of elements of the system to assist weaker students, however, if this is done, the students should be asked to represent other sections of the system in detail.

Possible requirements for each key skill could include:

- Identify the purpose of an information system and the type of network described in a given written scenario

Provide a series of questions that will enable the student to demonstrate their understanding of the information system contained within the scenario.

- Represent visually the following components of a networked information system and their relationships: the equipment; key sources of data used in the system and the people involved with the system

A requirement to construct a diagram (either using appropriate software or by hand) of the network that has been described in the scenario. This may also include such elements as simplistic data flow diagrams and network diagrams.

- Annotate the components to indicate the roles of the people involved with the system

The diagram that is constructed by the students needs to be more than just a representation of the layout of the physical network. It must also include the people in the system. Students would need to demonstrate that they understand the roles that the individuals have in the system, the data they provide and the information that they require from the system. It would also be expected that students would be able to demonstrate that they understand the relationship between the various people who are involved with the system.

- Analyse the operations of an information system in order to explain why the identified topology was chosen and comment on its appropriateness

Students will need to be able to identify the nature of the system topology that has been describer and be able to identify the advantages and disadvantages of this particular set up. The advantages and disadvantages that are identified by the students will need to be related to the purpose and functions of the particular system, rather than generic comments based on a particular topology.

Unit 3: Outcome 2

To analyse an information system and explain and justify a detailed design for a new or modified networked information system.

OVERVIEW

This outcome requires that students analyse an information system and explain and justify a detailed design for a new or modified networked information system. It should demonstrate the knowledge and skills specified mainly in the area of study 2, Information systems engineering.

Unit 3 requires students acquire and apply knowledge and skills to analyse and design information systems. They analyse the operation of an information system, and explore design options in order to develop the physical design specifications for a new or modified networked information system.

Students are to provide their analysis and design of a case study in either:
- a written report or
- a poster format.

Both formats require that the student provide detailed documentation of analysis and design techniques.

KEY SKILLS and AREAS OF STUDY

Key Skills	**Area of Study**
• Analyse an existing information system to identify why it needs to change	AS 3.2.1 AS 3.2.2
• Propose a range of methods to collect data	AS 3.2.5
• Formulate the goals and objectives for the new or modified information system	AS 3.2.3 AS 3.2.9 AS 3.2.11
• Document the logical design of the new or modified information system	AS 3.2.4 AS 3.2.7 AS 3.2.8 AS 3.2.13
• Describe the hardware and software specifications of the new or modified information system	AS 3.2.4 AS 3.2.6 AS 3.2.10 AS 3.2.12
• Select a system objective and identify two hardware and/or software alternatives	AS 3.2.9 AS 3.2.11 AS 3.2.12
• Evaluate the hardware and/or software alternatives on the basis of their technical, operational or economic feasibility	AS 3.2.11 AS 3.2.14
• Recommend the hardware and/or software components for the new or modified system and state criteria to evaluate the performance of the system	AS 3.2.10 AS 3.2.14

SUGGESTED STUDENT BACKGROUND

Before assessing this outcome, students will need to have completed the theory associated with Unit 3, Area of Study 1 and Area of Study 2.

It is assumed (details will be provided in the Assessment Guide), students would need to be able to analyse an information system detailed in a case study and explain and justify a detailed design for a new or modified networked information system. Students would be supplied with case studies that provide opportunities to practise, analysing the information system, defining information system goals and objectives, proposing methods to collect data, documenting the logical design of an information system, describing hardware and software specifications for an information system, evaluating hardware and software alternatives and stating criteria for evaluating system performance. Students, in particular, need to develop skills in documenting the logical design of a system, creating context diagrams, data flow diagrams and interpreting data dictionaries. Students also should become familiar with the tools to represent the physical design of an information system, structure charts and system flow charts and be able to interpret these.

This outcome does not require students have any specific software skills. The sketching of the analysis and design tools such as context diagrams, data flow diagrams, system flow charts, input/output charts, hierarchy charts and structure charts can be completed as a non-computer task. Software such as Microsoft Word, Visio or Inspiration can be used to analyse and design the information system, if desired. If these software packages are to be used, it is assumed that students will have been given experience in the software to be used before the beginning of the outcome.

TIMEFRAME FOR ASSESSMENT

The outcome represents 50% of the assessment for Unit 3. The preparation theory associated with this Area of Study and the outcome should take around 9-10 weeks of the course time to complete.

CREATING AN ASSESSMENT TASK

Unit 3, Outcome 2 and Unit 3, Outcome 3 naturally flow on from one another so the analysis of an information system and subsequent design for a new or modified system can become the basis for the system design in Outcome 3. It is therefore recommended that you develop these two outcomes together.

Possible requirements for each key skill could include:

- Analyse an existing information system to identify why it needs to change

Students could respond to questions to identify problems with the current system that will identify their understanding of economic, social and technical factors prompting change within organisations. In addition, students may be questioned on the role and functions of the components of an information system, including people, equipment, procedures and data.

- Propose a range of methods to collect data

Students should demonstrate understanding of suitable data collection methods. These include both primary and secondary data sources and data acquisition methods such as direct observation, surveys, interviews, system and program documentation and logs. Students may be asked, for example, to identify three data sources and two methods of acquiring data about the current information system.

- Formulate the goals and objectives for the new or modified information system

Students should demonstrate the ability to identify suitable information system goals and objectives for the new or modified system. Students could be asked, for example, to identify an information system goal and two objectives of the new or modified information system.

- Document the logical design of the new or modified information system

Students should demonstrate skill with the use of the design tools to document the logical design of the new or modified information system. Students should show proficiency with the use of context diagrams, data flow diagrams and data dictionaries to document the system. For example, students could be asked to draw a context diagram and data flow diagram for the new or modified information system. Students could also be asked to further document and explain their design of the new or modified system with the use of a data dictionary.

- Describe the hardware and software specifications of the new or modified information system

Students are required to demonstrate knowledge of the functions and characteristics of hardware and software component options and procedures available to meet the requirement specifications. Students should also be aware of physical design specifications, including the output and input devices, format, size and use of files, software capabilities, control procedures, backup procedures, security procedures and virus protection. In the outcome, students may be asked, for example, to describe the hardware and software specifications for the new or modified information system.

- Select a system objective and identify two hardware and/or software alternatives

Students are required to apply their knowledge of the information system objectives to specific hardware and/or software options. Students should consider the types of data and the range of equipment appropriate for inputting, processing, storing, accessing, and outputting data and information for the new or modified information system. Students may be asked , for example, to identify a system objective for the new or modified information system and discuss two hardware and/or software alternatives, which are appropriate.

- Evaluate the hardware and/or software alternatives on the basis of their technical, operational or economic feasibility

Students are required to demonstrate knowledge of applying technical, operational and economic criteria for evaluating the feasibility of alternative design options. It may be suitable for students to develop a feasibility analysis matrix for the new or modified information system. Students may be asked, for example, to evaluate the hardware and/or software alternatives for technical, operational or economic feasibility.

- Recommend the hardware and/or software components for the new or modified system and state criteria to evaluate the performance of the system

Students are required to demonstrate understanding of applying criteria for evaluating the performance of proposed information systems, including efficiency, effectiveness, cost and maintainability. Students are required to clearly indicate the hardware and/or software components that they recommend for the new or modified information system. Students are also required to list criteria that they will use to evaluate the performance of the new or modified information system.
When designing a task for this outcome, teachers will need to provide a case study scenario for students to analyse. It is essential that the case study provided must require a networked solution to the information system problem. The case study must also provide an opportunity for students to apply some of the phases of the systems development life cycle (SDLC) – analysis and design. The case study should contain sufficient detail for students to be able to identify problems with a current information system. There also should be sufficient detail to enable students to identify primary and secondary data sources and a range of suitable data acquisition methods. The case study should also provide enough background to enable students to state information system goals and objectives. The case study should allow enough flexibility for students to apply their design tools but also allow students to think creatively to develop the most appropriate solution to the problem.

ASSESSMENT TASK OPTIONS

This task can be assessed using a written report (including documentation of analysis and design techniques) or a poster (including documentation of analysis and design techniques).

If the poster option is selected, it would be expected that the students would be required to produce a poster that accurately represents an analysis of an information system and justifies a detailed design for a new or modified networked information system. Students should ensure if this option is used that they still provide sufficient detail to address each of the key skill areas required. The concern with this option is that students may have a tendency to brevity and therefore risk not fully addressing the key skill areas.

The written report option provides greater scope for more able students to demonstrate their superior understanding of the concepts that are assessed in this outcome. The written report would tend to encourage students to develop a solution which is more detailed and at far greater depth. The written report would still enable students to use the design tools at appropriate stages in the outcome to graphically explain the processes in the new or modified information system.

It would also be expected that more able students should provide a comprehensive report, which clearly identifies the problems with an existing information system. The top-end student would provide a report consisting of the following specific areas. Highly appropriate data sources and collection methods would be identified. Goals and objectives of the information system would also be clearly and appropriately stated. Logical designs of the information system would be portrayed accurately. Hardware and software specifications for the information system would be accurately and appropriately described. The feasibility of hardware and/or software alternatives would be thoroughly evaluated. Criteria to evaluate the performance of the system would also be carefully and accurately selected. Finally, in the case of the able student the report would clearly be linked to the case study, rather than providing generic responses.

Unit 3: Outcome 3

To produce a software module, in response to a system design, and verify its performance against the design specifications.

Approved programming languages for 2003 – Information Systems

Students will use one programming language from the accompanying list, to develop purpose-designed software. In the development of this software, students should be able to:

- Develop a graphical user interface (GUI) for use either within an organisation or external to it
- Construct and use data structures, for example arrays, strings, sets, lists, tables, records and stacks
- Design, construct and use files to store and retrieve data
- Design and apply data-validation techniques
- Use program control structures: selection, iteration and sequencing.

The purpose-designed software will entail the use of objects, methods and their properties, and event-driven programming.

List of approved programming languages

Delphi
Visual Basic (not Visual Basics for Applications) /REALbasic
Visual C++
OpenScript
Hypertalk
Visual Dbase
Visual FoxPro
Javascript, VBScript, Jscript
Visual J, Java
Perl, PHP, Python

Teachers of Information Systems should note that the list of approved programming languages is revised each year and is published in the VCE Bulletin

OVERVIEW

This outcome requires students to produce a module, a part or segment of what would be considered a complete solution to a identified information processing problem. Students are also asked to consider how the program has taken into account legal obligations and ethical considerations. The assessment task is an information technology solution (in response to a system design) and a written report.

Students during Unit 3 develop the fundamentals skills in the chosen programming language (see above list). As well as gaining an understanding of stages of software development. The focus in this unit is on a workable knowledge of these stages; Unit 4 requires a more detailed knowledge. It also asks students to investigate and consider their role as programmers in a societal context.

KEY SKILLS and AREAS OF STUDY

Key Skills	Area of Study
• interpret the design specifications by representing processes in the form of algorithms and data structures in the form of a data table	AS 3.2.3 AS 3.2.7 AS 3.2.8 AS 3.2.9 AS 3.2.13 AS 3.3.1 AS 3.3.5 AS 3.3.6
• use a programming language from the approved list published annually by the Victorian Curriculum and Assessment Authority	AS 3.3.2 AS 3.3.3 AS 3.3.9
• apply relevant constructs of the programming language to produce a working module	AS 3.3.4 AS 3.3.11
• prepare internal documentation for the module	AS 3.3.12
• compare the intended and actual module capabilities	AS 3.3.8 AS 3.3.10
• explain how the program has taken into account an ethical consideration or a legal obligation.	AS 3.3.7

SUGGESTED STUDENT BACKGROUND

As there is no prerequisite for entry into Information Systems it can't be expected that students have undertaken any prior programming or IT courses. However, it would be expected that students undertaking VCE would have attained the knowledge and skills indicated in Level 6 of the CSF.

As programming requires both logic and sequencing skills students will need to engage in a range of learning activities to develop basic language syntax as well as activities that develop their problem solving skills.

It is expected that students should have an understanding of System Development Life Cycle (SDLC) and where, how and why software development fits into the development phase. They should also have sufficient skill in the programming language to undertake the information-processing problem provided. Students should have also investigated, discussed, analysed the role of a programming in the SDLC.

TIMEFRAME FOR ASSESSMENT

Outcome 3 is 30% of Unit 3, thus approximately 30% of the time allocated to this Unit should be covering the knowledge and skills of this Outcome.

It is expected that this outcome would occur towards the end of the Unit after completion of Outcome 2. However Outcome 1 does not have to be completed to undertake this Outcome.

The assessment task logically falls into three distinct sections: analysis of design (provided to the student), production and testing/evaluation.

- Analysis of Design – the student will provide detailed designs using the selected algorithmic methodology and construct a simple data table.
- Production – the student will use the designs provided as well as the ones he/she developed to create a solution to ***part*** of the overall system problem.
- Testing/Evaluation – the student constructs a checklist/test table that compares intended with actual, that tests functionality as well as objectives of module as specified in the design statement. It should also evaluate whether it has met its legal obligations and has considered its ethical responsibilities.

CREATING AN ASSESSMENT TASK

What should be provided to students?

Listed is what is typically included in a system design. The assessment guide may provide further details.

- An organisational overview
- A description of current practices
- Clear statement of the information problem
- A design for the solution – this could a combination of the following:
  - System objectives
  - System constraints – such as cost, scheduling
  - A hierarchy chart
  - A context diagram
  - A data flow diagram
  - System flow chart
- Outcome constraints – that clearly identifies the module (what part of the problem) the student must develop and possibly the skills expected.
- Data – students could be provided with
  - data files to manipulate
  - a program/interface shell
  - code 'cheat sheets' from teacher or student developed

Points to consider

- Develop Outcome 2 and 3 together. There is a natural flow from one to the other. The solution to Outcome 2 can be the basis for 'System Design' you need to provide to students for Outcome 3.
- Will you allow student to bring in cheat sheets, all their programming notes, or nothing. This will have a bearing on the complexity of the problem set.
- Provide a scenario that is relevant and gender inclusive.
- 'Futureproofing', will you reuse, recycle or invent assessment tasks each year. It is worth putting in the effort to create detailed well thought out scenarios the first time around, that can then be easily edited, updated, remodelled.

SCOPE OF THE TASK

It is important to remember that students develop only a module for this assessment task. It is a small part of an overall system solution, however, it should be discrete and workable within the context of the problem set.

The complexity of the programming displayed is a key design consideration. VCAA has produced statement to help provide a framework (see Approved Programming Languages above). This specification indicates what skills and knowledge the student should have in their selected language by the end of Unit 4.

Unit 4: Outcome 1

To apply the principles of software development to produce purpose-designed software that takes into account the information system objectives and the needs of the end-users.

OVERVIEW

This Outcome requires students to develop a solution to an information problem. It should demonstrate the knowledge and skills in the study design. Further details are provided the VCAA VCE Bulletin June 2002 (see Unit 3: Outcome 3).

Unit 4 requires students to have an in depth knowledge of software development and its role in the SDLC. This Unit also has a focus on Implementation and Evaluation, consideration of the end-user and their needs, and conflict avoidance is stressed. This is the culmination of their programming and builds on skills developed in Unit 3.

Outcome 1 is 60% of Unit 3, thus approximately 60% of the time allocated to this Unit should be covering the knowledge and skills of this Outcome.

While the outcome is allocated 60 marks, students are required to complete **two** assessment tasks, namely:

- information technology solution (excluding user documentation but including internal documentation (45 marks), and
- user documentation and a explanation of how the software may cause conflict between the developers and the end users (15 marks). The explanation can be in the form of:
    - a written report
    - a test.

A separate score will be provided to VCAA for each assessment task, however, for classroom purposes the task can be viewed as a single task. For more detail on this see page study design page 52 and 74.

KEY SKILLS and AREAS OF STUDY

Key Skills	**Area of Study**
• identify factors affecting the design and implementation of the software solution	AS 4.1.3 AS 4.1.4
• identify and define the requirements of the software solution	AS 4.1.1 AS 4.1.9
• represent specifications in the form of algorithms and data tables	AS 4.1.6 AS 4.1.7 AS 4.1.8
• develop and justify data-validation techniques	AS 4.1.1
• develop testing procedures	AS 4.1.8
• write the program including appropriate internal documentation	AS 4.1.2 AS 4.1.5
• write appropriate user documentation	AS 4.1.10 AS 4.2.5
• run and debug the program so that it produces output that is well organised and readable and that meets user needs	AS 4.1.8
• explain how purpose-designed software may cause possible conflict between the person or organisation responsible for developing it and an end-user.	AS 4.1.11

SUGGESTED STUDENT BACKGROUND

It is expected that students will by the end of this Unit have a thorough and detailed understanding of the SDLC and the phases of software development and that software development is an activity that may or may not need to occur as part of a new or modified system. The focus for the Unit is on the Implementation and Evaluation of information systems.

Software development must consider the end-users and implementation considerations such as changeover type, training, documentation and procedures are not just the domain of the system analysts they are important concepts when developing purpose design software.

TIMEFRAME FOR ASSESSMENT

As Outcome 1 is 60% of the Unit it would be expected that it would occur towards the end of the Semester. Outcome 1 does not need to precede Outcome 2. As with the current Outcome 1, students must be provided with a design brief that identifies the information system objectives and the needs of the end-users.

The Outcome falls into four distinct sections: analysis/design, testing methodology, development, and report.

- Analysis/Design – the students discuss factors effecting the design and implementation of the software created, define requirements and use their selected algorithmic methodology to design the solution, including a range of validation techniques.
- Testing Methodology – discuss and develop testing procedures, for example a test table, a user survey to occur during user testing.
- Development – construct a complete solution to the problem specification including internal documentation.
- Report – construct documentation for the solution created and discuss causes of conflict between the programmer and the end-user.

CREATING AN ASSESSMENT TASK

What should be provided to students?

Listed is what is typically included in a design brief appropriate for this task. The assessment guide will provide further details.

- Design Brief this should include:
  - An organisation overview
  - Discussion of current practices
  - Clear statement of information problem
  - May also include diagrammatic representations such as:
    - DFDs
    - system flowcharts
  - Constraints – any restriction that my limit the solution

Points to consider

- Outcome 3 Unit 3 and Outcome 1 Unit 4 should be planned together. The end point need to be identified (see VCAA list), timeline identified and preliminary tasks created to ensure all aspects of the both Outcomes are done in a timely fashion to allow students to utilise those skills in each Outcome.
- Outcome 1 Unit 4 may be the complete solution indicated in Outcome 3 Unit 3.
- Student do not need to remember endless code, however, they need to show skill in using the language to meet the problem specified. Students may bring in sample code, may use the help, and utilize books and references for their coding.
- The completion of this task should follow the ideals of short sharp assessment; students do not need to create an overly complex solution that requires them to demonstrate the same skills in multiple ways.
- Students do not need to demonstrate all skills in their assessment task.

Unit 4: Outcome 2

To propose and justify development, implementation and evaluation strategies for introducing to an organisation an information system that will operate in a global environment.

OVERVIEW

The assessment task options that are available are:
- a test or
- a written report.

Regardless of the option that has been selected, it is suggested (but not mandatory) that teachers provide a case study / studies as stimulus material for the students to respond to. These case studies need to be global in context and student responses need to demonstrate their understanding of the issues of global information systems. It is possible, however, for students to respond to a series of discrete questions if undertaking the test option.

KEY SKILLS and AREAS OF STUDY

Key Skills	Area of Study
• Identify the purpose of the information system	4.3.3
• Select and justify the hardware and software components to fulfil the physical specifications	4.3.1
• Devise appropriate testing techniques	4.2.3
• Propose an implementation strategy that includes a description of the changeover method, types of documentation, training and procedural requirements	4.2.4
• Formulate strategies to evaluate the performance of the proposed information system	4.2.9
• Propose project management strategies to coordinate the development, implementation and evaluation of the proposed information system	4.2.8
• Explain one way in which the organisation and its end-users will be affected by the implementation of the proposed information system	4.3.5

SUGGESTED STUDENT BACKGROUND

It is assumed that students would have completed the majority of the theory associated with Unit 4 Area of Study 3 before completing this outcome. Assumed knowledge would include : network topology and hardware, purposes and functions of information systems in global contexts and problems, advantages and disadvantages of information systems in a global context.

There are no specific software requirements for the completion of this outcome. If a written report is the assessment tool used, it would be assumed that students would have a working knowledge of the software they would be expected to use in the compilation of the report.

TIMEFRAME FOR ASSESSMENT

This outcome represents 40% of the assessment for Unit 4. As such it, and the preparation theory associated with it, should take around 5-6 weeks of the course time to complete.

CREATING AN ASSESSMENT TASK

In creating an outcome assessment task, teachers need to ensure that the task draws on all of the key knowledge and key skills.

Suggestions for a test:

A series of questions that cover each of the key skills will be required. It would be appropriate to provide students with stimulus material upon which the questions would be based. In doing this, it would be better to have a number of small case studies or scenarios and two or three questions based on each, rather than one larger case study with perhaps 20 questions based upon it.

For a written report:

Students should be provided with a scenario and asked to produce a report that analyses the information system in question. Students should be prompted to produce a report that had broad categories rather than answering a series of specific questions.

Regardless of which option is selected, it is important that the questions asked, or categories covered, assess the key skills of the outcome, specifically:

- Identify the purpose of the information system

Students should be required to identify why the information system will be required, articulate the goals of the system and key indicators to be used by the organisation in determining the efficient functioning (and success) of the system.

- Select and justify the hardware and software components to fulfil the physical specifications

The specifications (especially where a test is used as an assessment tool) can be provided to the students and students identify appropriate hardware and software components. Under test conditions (where students will not be able to research components), they may be provided with a range of options from which to select from (including ones that are not appropriate) and asked to justify their selections from the data provided.

- Devise appropriate testing techniques

A testing plan should be included. In the case of a report, students should be required to develop a testing plan from scratch, however in a test, students may be provided with a partial testing plan or told of a particular problem as asked to devise a strategy that would be able to determine if the problem has been rectified.

- Propose an implementation strategy that includes a description of the changeover method, types of documentation, training and procedural requirements

In a report, students would simply be asked to proved an implementation strategy that covers the listed aspects, however, for a test, it would be appropriate to ask a series of questions, each of which focuses on a specific aspect of the implementation.

- Formulate strategies to evaluate the performance of the proposed information system

In a report, students would be expected to link the evaluation of the performance to the key indicators nominated when they identified the purpose of the information system. For a test, though, it would be possible to provide the student with a number of different situations and ask them to devise a strategy for evaluating the performance of each.

- Propose project management strategies to coordinate the development, implementation and evaluation of the proposed information system

Students would be expected to demonstrate their knowledge of project management practices, and questions on a test would be expected to allow them to do this. Possible questions may ask them to develop a strategy for a particular situation or may provide them with a flawed strategy, and require them to comment on ways of rectifying the flaws. In a written report, it would be expected that appropriate tools were incorporated in the proposed strategies – such as the use of Gantt Charts, Pert Charts and/or project management software.

- Explain one way in which the organisation and its end-users will be affected by the implementation of the proposed information system

For a report, this will be an obvious conclusion – detailing the benefits that the proposed system will deliver. While students may include more than one affect, there would only be the need to go into detail for one.
In a test, students would be provided with a scenario and asked to identify a possible affect and explain what the consequences will be for the end users.

SCOPE OF THE TASK

Students will be expected to demonstrate a thorough understanding of project management, network hardware, network software and technology terms that are commonly in use. They would not be expected to know specific propriety terms and properties – for example, while students would be expected to understand the roles of network operating systems like Novell or Windows NT, they would not be expected to know specific options within a particular OS.

SPECIAL REQUIREMENTS IN DESIGNING THE TASK

The scenario/test that the students are presented with must place the information system in a global context. It would not be appropriate to set a task that focuses on a local area network.

Week	*Area of Study*	*Programming Skills*	*Possible Activities*
1	**What is a computer?** Computer Architecture - main components What is an information system? - components, roles of people, function of components		- Pull apart and put back together an old computer - Use inspiration to draw a diagram and label and describe all components.
2	Purpose of Information Systems **What is a network?** - Types, topologies, components (including cabling), operating system, protocols. - Drawing a network	Use of tools such as SmartDraw, Inspiration, Word, Web development software.	- Examples – case studies videos, newspaper articles etc - Tour of school network facility. - Make a patch cable - Use SmartDraw networking graphics to represent school network or local organisation.
3	**<u>OUTCOME</u> 1 (Double Session – 20%)** Introduction to programming concepts - data types, data structures, data files (naming), data dictionaries - internal documentation	Introduction to programming language.	
4	System Development Life Cycle Overview **Why systems change?** **SDLC – Analysis** - data collection - methods of acquisition	Preliminary programming tasks equivalent to about 1-2 classes a week or 30% of class time.	
5	Tool to represent analysis and design - context diagrams - data flow diagrams **Feasibility of design options.**	(see June VCAA Bulletin for approved language list and description of what students should be able to do by the completion of Unit 4)	- Activities from Eastern House texts - activities from VITTA web site created by ITSkillsHub
6	- DFDs (cont) **Information systems** - equipment - procedures - system flow charts		- Collect information from web sites such as webopedia and howthingswork. Each student creates a web site on a component – current and emerging technology.
7	**Stages of software development**. Approaches to design software. **Roles of programmers** - legal obligations - ethical obligations.		

8	**Algorithms** - Flowcharts, Pseudocode, NS Diagrams **Specific system requirement** - input, output, processing **Hierarchy/structure charts**		- Examples, examples, examples. - Questions from past papers. - NSW Exam questions
9	**Algorithms** - more detailed examples of pseudocode **File backup, archiving and disposal and data security**		
10	**Test Algorithms (Test tables)**		
11	**Physical design alternatives** **Criteria for evaluating software** **Criteria for evaluating systems**		- Debate on possible design alterative i.e. three proposals, groups have to present their proposal and justify
12	**<u>OUTCOME</u> 2 (all week – 50%)**		
13	**Data representation methods** - Binary, ASCII, Hexadecimal -		
14	**<u>OUTCOME</u> 3**		
15	**<u>OUTCOME</u> 3 (Two Weeks – 30%)**		

INFORMATION TECHNOLOGY: INFORMATION SYTEMS UNIT 4

Week	*Area of Study*	*Programming Skills*	*Possible Activities*
1	**Using networks in a global environment** – revisit network essentials (unit focui), purpose, advantages and disavantages **Data storage and access** – serial, sequential, random access	**Data files** – using, creating, writing to	
2	**Data Structures** **Searching files** – algorithms		
3	**Sorting** – algorithms **Acquisition of technology** – factors that influence decision		
4	**System software, operating system, utilities** **Developers vs End Users** **Factors affecting software design**	Utilities provided in programming environment	
5	**Testing** - Algorithms - Software - Hardware **Implementation overview** - Documentation		
6	**<u>OUTCOME</u> 1**		
7	**<u>OUTCOME</u> 1**		
8	**Project Management** - Gantt Charts - PERT Charts		
9	**Implementation** - Training - Security -		
10	**Evaluation** - Criteria - Strategies		
11	**<u>OUTCOME</u> 2**		
12	**EXAM PREP**		
13	**EXAM PREP**		
14	**EXAM PREP**		
15	**EXAM PREP**		