# Computer Applications

| LEVEL 2 | 5 TCE CREDIT POINTS |
|---|---|
| **COURSE CODE** | ICT205114 |
| **COURSE SPAN** | 2019 — 2025 |
| **READING AND WRITING STANDARD** | NO |
| **MATHEMATICS STANDARD** | NO |
| **COMPUTERS AND INTERNET STANDARD** | YES |

This course is current for 2024.

## Computer Applications is designed for learners who desire to gain greater competency in the use of specific computing applications

It allows for development of practical computing skills and detailed coverage of social issues, along with occupational health and safety concerns. It builds on the knowledge, understanding and skills articulated in the Essential Skills - Using Computers and the Internet course. It is designed to allow learners to undertake focused learning in a particular, applied area of computing. This approach recognises that the application of computers and associated digital technologies covers a wide range of context and areas of speciality, and provides opportunity for a greater depth of learning to be acquired in contexts that are relevant to learners' needs and interests.

**Course Description**

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**Learning Outcomes**

On successful completion of this course, learners will be able to:

1. explain basic computing terms and concepts
2. identify and describe social, and ethical issues, and issues of health and safety related to use of computers and related digital technologies
3. proficiently use a variety of computer hardware and software
4. find, select and refine information from a variety of sources
5. use computers and related digital technologies to solve problems
6. communicate ideas and information to different audiences using computers and related digital technologies.

**Access**

Learners undertaking this course must have demonstrated Satisfactory Achievement in Essential Skills – Using Computers and the Internet Level 2 or an equivalent standard of knowledge, understanding and skills articulated in that course, or be studying Essential Skills – Using Computers and the Internet concurrently with this course (for example, on a size value 10 'line' or equivalent).

**Pathways**

Learning pathways to this course, and possible pathways after successful completion of the course, are described by the following diagram:
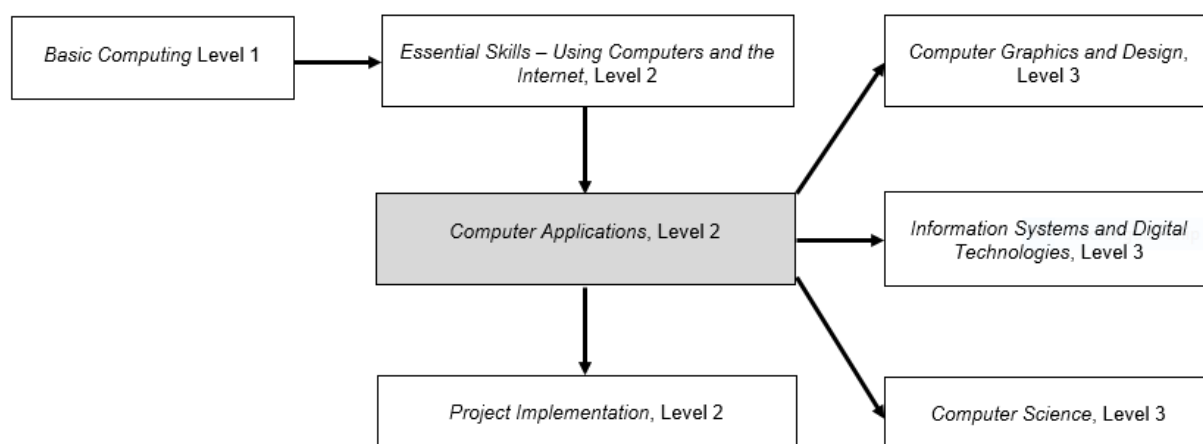


**Note:** Project Implementation is a Level 2, size value 5, course focusing on the development of effective communication, problem solving, time management, reflective practice, and working with others/in teams. The course requires a learner to work as a member of a group or team. Examples of possible topics for Project Implementation related to themes in this Computer Applications course are given in the Appendix.

**Resource Requirements**

This course requires learners to have access to computers (desktop/laptop/tablet or other equivalent devices) with connection to the internet and email, hardware appropriate to tasks related to the selected theme(s), and software appropriate to the selected theme(s). Additional resources may be required depending on provider-selected theme(s) (see 'Course Content' below).

**Course Size And Complexity**

This course has a complexity level of 2.

At Level 2, the learner is expected to carry out tasks and activities that involve a range of knowledge and skills, including some basic theoretical and/or technical knowledge and skills. Limited judgement is required, such as making an appropriate selection from a range of given rules, guidelines or procedures. VET competencies at this level are often those characteristic of an AQF Certificate II.

This course has a size value of 5.

**Course Content**

Learners must undertake study in **one** of the following application themes:

- Information Processing
- Business
- Information Management
- Publishing
- Multimedia
- System Management and Support
- Programming and Control.

**THEMES**

INFORMATION PROCESSING
Knowledge and understanding of relevant concepts, for example:

- appropriate computer software and its capabilities
- the components of word processing and its applications
- file management including cloud storage
- health, safety and the environment
- appropriate layout for personal documents
- suitable work processes
- changes in the way people access and present information.

Related social and ethical issues such as:

- changing technology and its impact
- confidentiality
- academic integrity, intellectual property and copyright
- occupational health and safety
- recycling and consumables
- recognising the application of computers to the wider area of technology and employment.

Related skills in applied digital technology. For example, skills in using the software:

- producing personal documents relevant to the needs of a changing society
- integrating graphics with text
- research/process techniques
- effective time management
- extended keyboard techniques
- use of advanced editing and proof reading techniques
- composition in electronic media, for example: email.

Relevant individual and cooperative tasks:

These can be devised to provide practical experience and a learning environment for the knowledge and skills content above. Example: a set of learning tasks based on:

- documents relating to social/sporting clubs
- presentation of essays/assignments and reports
- personal correspondence
- résumés and job applications.

BUSINESS
Knowledge and understanding of relevant concepts, for example:

- business software
- more advanced word processing skills
- display techniques
- a variety of business documents
- workplace safety.

Related social and ethical issues such as:

- confidentiality
- copyright and intellectual property
- recycling and consumables.

Related skills in applied digital technology and its impact, for example skills in:

- word processing, database, spread sheets, audio and presentation packages
- efficient and accurate input of data
- advanced keyboard operation
- file management including cloud storage
- data transfer.

Relevant individual and cooperative tasks.

These can be devised to provide practical experience and a learning environment for the knowledge and skills content above. Example: a set of learning tasks based on the following:

- financial statements
- business correspondence
- meeting documents
- graphs and charts
- formal reports.

INFORMATION MANAGEMENT

This theme focuses on the management of smaller computer-based information systems. Learners will be given opportunities to familiarise themselves with a number of commonly used applications so that they can make judgements about the appropriateness of different applications for a particular task.

Knowledge and understanding of relevant concepts, for example:

- hardware used in collecting and managing smaller sets of data including text, sound and images
- characteristics and suitability to task of software applications commonly used for information organisation, retrieval and presentation, for example:
  - word processors, desktop publishers, presentation software (e.g. PowerPoint), multimedia applications, web page editors, accounting, spreadsheet and database management systems, statistical packages, geographical information systems packages
- language and concepts associated with selected software applications
- user interface design (e.g. typographic and layout issues, appropriate use of media and macros)
- information integration between applications and/or using communications options, such as:
  - using charts from a spreadsheet in a published newsletter or converting Word documents to web pages
  - using the Internet as a means of collection or distribution of information, attaching documents to email
- file management including cloud storage
- management of data and resources, task management, working in a team, documentation, dealing with clients, operating procedures
- related social and ethical issues such as:
  - data accuracy and currency
  - the reliance of modern society on organised information systems
  - academic integrity, intellectual property and copyright
  - impact of modern information storage and retrieval techniques
  - information ownership and privacy
  - database corruption and fraud
- related skills in applied technology
- practical tasks that:
  - allow learners to practice task management and gain skills and understanding associated with applications chosen for study
  - provide learners with opportunities to organise and present information in a meaningful manner.


PUBLISHING

Knowledge and understanding of relevant concepts for example:

- typographic design and page layout concepts
- design issues (e.g. consistency, metaphor, use of colour)
- image, sound and video properties and manipulation
- understanding of the technology of the hardware used (e.g. properties of output devices for published material, printers or monitors)
- taking intended audiences into account
- accuracy of content and proof reading
- file management including cloud storage.

Related social and ethical issues such as:

- accuracy of content
- academic integrity, intellectual property and copyright
- issues of image and other source material editing
- changes in the way people access information and emerging publication opportunities.

Related skills in applied digital technology, for example, skills in using the following:

- word processor
- analysis software (e.g. spreadsheets and charting software)
- graphics enhancement packages
- video and sound editing software
- desktop publisher
- slide show presentation software
- web editor software
- digital camera
- scanner
- using various printers and setting up monitors.

Relevant individual and cooperative tasks.

These can be devised to provide practical experience and a learning environment for the knowledge and skills content above. Examples might be to publish a brochure with images, a PowerPoint presentation including sound and scanned photos or a simple web page.


MULTIMEDIA

This theme focuses on a hands-on approach to concepts involved in multimedia production and use of software applications that support multimedia preparation, as well as multimedia authoring packages.

Knowledge and understanding of relevant concepts, for example:

- understanding of the nature of media (e.g. sound, images, video, graphics, animation)
- typographic and user interface design (such as consistency, metaphor, use of colour, audience)
- storyboarding, navigation design
- digitising, organising and editing of media resources
- understanding of the technology and hardware used (e.g. storage, processing power, sound and video capture cards, compression)
- user interactivity and project customising
- scripting/programming concepts and techniques
- multimedia authoring software
- file management including cloud storage.

Related social and ethical issues, such as:

- accuracy of content
- academic integrity, intellectual property and copyright
- issues of source material editing
- changes in the way people access information and emerging multimedia applications.

Related skills in applied technology, for example, skills in using the hardware and software, e.g. some of:

- graphics creation and enhancement
- video and sound capture and editing software and hardware
- animation software
- multimedia authoring software
- website or blog authoring and management applications (Content Management Systems (CMS), WordPress, Blogger)
- digital camera and/or scanner
- midi music capture and editing software and hardware
- web site management software.

Relevant individual and cooperative tasks.

These can be devised to provide practical experience and a learning environment for the knowledge and skills content above. An example might be a set of learning tasks based on:

- video and sound capture
- image digitising and enhancement
- animation, simple authoring/web page development and scripting.

## SYSTEM MANAGEMENT AND SUPPORT

This theme focuses on setup and management issues that relate to computer use. The study may take a specific focus on hardware, computer networks or user and system support.

Knowledge and understanding of relevant concepts, for example:

- key components of a system (hardware, software, communications and users)
- hardware (such as processor, RAM and disc options and upgradability)
- software (software installation and setup, operating systems, utilities)
- networking (addressing, networking media, networking devices, net operating systems)
- management (task management, working in a team, documentation, dealing with clients, operating procedures)
- file management including cloud storage.

Related social and ethical issues, such as:

- ethical dealings with clients
- security issues
- protection of user privacy.

Related skills in applied digital technology.

Application of concepts to practical tasks:

- upgrade RAM, set up a small network
- configure aspects of an operating system
- solve simple client problems.

## PROGRAMMING AND CONTROL

This theme provides an introduction to the use of programming techniques and concepts to create or control computer applications or control external peripheral devices. Emphasis can be on computer programming in a conventional sense, developing macros to drive applications, using scripting languages to control media or applying programmed control to robots or other external devices.

Knowledge and understanding of relevant concepts, for example:

- problem solving and planning
- language constructs (linear or object oriented)
- development of good programming habits
- user and device interfaces
- the concept of data types
- control sequences (branching, loops)
- available functions and procedures and their parameters
- file management including cloud storage.

Related social and ethical issues, such as:

- importance of documentation and structure
- academic integrity, intellectual property and copyright
- viruses
- consequences of program malfunctioning.

Related skills in applied digital technology, for example:

- skills in program planning and development
- flowcharts or storyboards
- third party software for program development
- program coding, editing, compiling/interpreting
- device interfaces.

Relevant individual and cooperative tasks:

These should provide practical experience in applying the knowledge and skills content above (e.g. applying concepts of programming through a set of smaller programs, event handlers or macros).

## Assessment

Criterion-based assessment is a form of outcomes assessment that identifies the extent of learner achievement at an appropriate end-point of study. Although assessment – as part of the learning program – is continuous, much of it is formative, and is done to help learners identify what they need to do to attain the maximum benefit from their study of the course. Therefore, assessment for summative reporting to TASC will focus on what both teacher and learner understand to reflect end-point achievement.

The standard of achievement each learner attains on each criterion is recorded as a rating of 'C' (satisfactory standard) or 'A' (high standard) according to the outcomes specified in the standards section of the course document.

A 't' notation must be used where a learner demonstrates any achievement against a criterion less than the standard specified for the 'C' rating. The 't' notation is not described in course standards.

A 'z' notation is to be used where a learner provides no evidence of achievement at all.

Providers offering this course must participate in quality assurance processes specified by TASC to ensure provider validity and comparability of standards across all awards. To learn more, see TASC's quality assurance processes and assessment information.

Internal assessment of all criteria will be made by the provider. Assessment processes must gather evidence that clearly shows the match between individual learner performance, the standards of the course and the learner's award. Providers will report the learner's rating for each criterion to TASC.

## Quality Assurance Process

Each provider will submit bodies of learners' work sufficient to allow an assessment against a nominated range of criteria and the overall award to an annual review meeting organised by TASC. The work, while not necessarily be fully resolved, will be assessed by the provider against the range of nominated assessment criteria and the overall award. TASC will give each provider guidance regarding the selection of learners and the nominated criteria.

Each body of work that providers submit to the meeting will include sufficient and appropriate material for judgements to be made about the learner's standard of numeracy. The review meeting will give advice regarding the provider's interpretation and application of the selected criteria's standards to the evidence of student work. Providers are expected to act on this advice.

TASC may require providers to supply further samples of individual learners' work to determine that standards have been applied appropriately and/or undertake audits. The nature and scope of such requirements will be risk-based.

Additionally, TASC may select to undertake scheduled audits of this course (Provider Standards 1, 2, 3 & 4), and of work requirements.

## Criteria

The assessment for Computer Applications Level 2 is based on the degree to which the learner can:

1. identify and apply basic terminology and concepts relating to computer hardware and software
2. identify social and ethical issues related to the use of computers
3. collect and communicate ideas and information using digital technologies
4. complete tasks and solve problems using computers and other digital technologies
5. plan and organise resources and activities to complete computer application tasks

**Standards**

## Criterion 1: identify and apply basic terminology and concepts relating to computer hardware and software

| Rating 'A' | Rating 'C' |
|---|---|
| *In addition to the descriptors for a 'C' rating*, the learner: | The learner: |

| Rating A | Rating C |
|---|---|
| correctly identifies hardware and software components for specific purposes and justifies the choice | correctly identifies hardware components and describes their usage |
| applies knowledge and understanding of hardware and software to effectively solve real world problems | correctly identifies software types and formats*, and describes their usage |
| | applies file management skills** |
| | describes ways of dealing with data storage issues***. |

\* 'software types and formats' includes, but are not limited to: differences between operating systems (OS), applications and files, and file types (e.g. .docx, .pdf, .jpg, .png).

\*\* 'file management skills' include, but are not limited to: opening/launching; saving; closing; deleting; renaming; duplicating; and transferring.

\*\*\* 'data storage issues' include, but are not limited to: space and drive types including cloud storage; security; and backup.

## Criterion 2: identify social and ethical issues related to the use of computers

| Rating 'A' | Rating 'C' |
|---|---|
| *In addition to the descriptors for a 'C' rating*, the learner: | The learner: |

| Rating A | Rating C |
|---|---|
| correctly identifies social and ethical issues related to specific situations and justifies the choice | describes social and ethical issues related to the use of computers and digital technologies |
| | correctly describes concepts of intellectual property and copyright |
| | correctly describes and complies with given principles and practices relating to use other peoples' information, images, ideas or words |
| accurately describes occupational health and safety issues related to specific situations, their possible impact on an individual's health/safety, and methods that could be used to avoid, remove or minimise adverse impact. | correctly describes and complies with given occupational health and safety procedures. |

## Criterion 3: collect and communicate ideas and information using digital technologies

| Rating 'A' | Rating 'C' |
|---|---|
| *In addition to the descriptors for a 'C' rating*, the learner: | The learner: |

| Rating A | Rating C |
|---|---|
| | |

| | |
|---|---|
| assesses the relevance, accuracy and completeness of collected information | collects relevant information from a range of sources, including the internet |
| considers and effectively addresses the needs of various audiences and/or stakeholders | selects and re-synthesises information into a logical presentation |
| | uses computer applications/digital media to clearly present ideas and information. |

## Criterion 4: complete tasks and solve problems using computers and other digital technologies

| Rating 'A' | Rating 'C' |
|---|---|
| *In addition to the descriptors for a 'C' rating,*<br><br>the learner: | The learner: |

| Rating A | Rating C |
|---|---|
| uses advanced features of selected software packages | selects and uses software and hardware appropriate to a given task |
| | uses basic features of selected software packages |
| | uses 'help' features, manuals and/or on-line support to solve problems |
| uses advanced internet search strategies including Boolean searches. | uses effective internet search strategies, and navigates and uses web-based applications. |

## Criterion 5: plan and organise resources and activities to complete computer application tasks

The learner:

| Rating A | Rating C |
|---|---|
| maintains task focus | maintains task focus for agreed periods of time |
| sets goals which are generally measurable, achievable and realistic, and plans effective actions | sets goals which are generally measurable, achievable and realistic, and follows given plans/directions |
| reflects on progress towards meeting goals, evaluates progress and plans future actions | reflects on progress towards meeting goals and articulates ways in which goals might be met in the future |
| considers, selects and uses strategies to manage and complete activities within established timelines. | uses strategies as directed to perform tasks within established timelines. |

**Qualifications Available**

Computer Applications Level 2 (with the award of):

> EXCEPTIONAL ACHIEVEMENT

> COMMENDABLE ACHIEVEMENT

> SATISFACTORY ACHIEVEMENT

> PRELIMINARY ACHIEVEMENT

**Award Requirements**

The final award will be determined by the Office of Tasmanian Assessment, Standards and Certification from 5 ratings.

The minimum requirements for an award in Computer Applications Level 2 are as follows:

> EXCEPTIONAL ACHIEVEMENT (EA)
> 5 'A' ('high standard') ratings

> COMMENDABLE ACHIEVEMENT (CA)
> 2 'A' ('high standard') ratings and 3 'C' ('satisfactory standard') ratings

> SATISFACTORY ACHIEVEMENT (SA)
> 5 'C' ('satisfactory standard') ratings

> PRELIMINARY ACHIEVEMENT (PA)
> 2 'C' ('satisfactory standard') ratings

A learner who otherwise achieves the ratings for a CA (Commendable Achievement) or SA (Satisfactory Achievement) award but who fails to show any evidence of achievement in one or more criteria ('Z' notation) will be issued with a PA (Preliminary Achievement) award.

**TCE Standard For Everyday Adult Use Of Computers And The Internet**

Learners who gain a Satisfactory Award in this course must be able to:

- use a computer and common software (such as a word processor, spreadsheet or database) effectively, safely and productively
- use the internet and email effectively, safely and productively.

A more detailed account illustrating the meaning of the standard is given in Appendix 3 of the Tasmanian Certificate of Education course document.

**Course Evaluation**

The Department of Education's Curriculum Services will develop and regularly revise the curriculum. This evaluation will be informed by the experience of the course's implementation, delivery and assessment.

In addition, stakeholders may request Curriculum Services to review a particular aspect of an accredited course.

Requests for amendments to an accredited course will be forwarded by Curriculum Services to the Office of TASC for formal consideration.

Such requests for amendment will be considered in terms of the likely improvements to the outcomes for learners, possible consequences for delivery and assessment of the course, and alignment with Australian Curriculum materials.

A course is formally analysed prior to the expiry of its accreditation as part of the process to develop specifications to guide the development of any replacement course.

**Expectations Defined By National Standards**

There are no national content statements relevant to this course.

**Accreditation**

The accreditation period for this course is from 1 January 2019 until 31 December 2025.

During the accreditation period required amendments can be considered via established processes.

Should outcomes of the Years 9-12 Review process find this course unsuitable for inclusion in the Tasmanian senior secondary curriculum, its accreditation may be cancelled. Any such cancellation would not occur during an academic year.

**Version History**

Version 1 – Accredited on 9 September 2013 for use in 2014 to 2018.

Version 2 - Accreditation renewal on 22 November 2018 for use from 1 January 2019 until 31 December 2021. Amendment to Version 1 include: addition of file management including cloud storage; refinement of Learning Outcomes; and changes to criteria and standard elements.

Version 2.a - Renewal of Accreditation on 14 July 2021 for the period 31 December 2021 until 31 December 2024, without amendments.

**Appendix**

This Appendix contains <u>examples of possible topics</u> for use in the course Project Implementation Level 2 (size value 5). These possible topics are related to themes in this Computer Applications course. Project Implementation requires providers to send Student Project Proposal(s) to TASC for approval prior to delivery and assessment. The example topics below and the suggested project structures may be useful resources in the development of Student Project Proposals. Note that more than one theme can be used in a single project if desired. See Project Implementation Level 2 for more information about the course.

INFORMATION PROCESSING

Projects could include appropriate graphics and text with regard for the intended audience, for example:

- class magazine
- surveys
- club documents
- meeting documents
- itineraries
- invitations and greeting cards
- assignments and reports.

**Suggested Project Structure**

1. Define the project – a definitive statement of personal requirements and the aim of the project
2. Planning (e.g. time management, design, list required content, images etc, list research tasks to be completed if applicable)
3. Team roles – as appropriate
4. Resource preparation and relevant research if applicable
5. Development of the project
6. Proof reading and editing
7. Project presentation/printing.

BUSINESS

Projects could include appropriate graphics and text with regard for the intended audience, for example:

- layout and design of documents related to particular areas of business (e.g. legal, technical, travel and tourism)
- documentation aspects of office procedure
- researched report on workplace safety
- promotional material
- a thematic approach to business documentation.

**Suggested Project Structure**

1. Define and plan the project
2. Team roles – as appropriate
3. Complete the project
4. Presentation.

INFORMATION MANAGEMENT

Some project examples:

- prepare a database or spreadsheet system to solve an information management problem
- set up and maintain a web site where information is organised for easy retrieval
- set up an information system for an enterprise group providing them with an integrated system of letter templates with letterhead
- a basic customer or product database, mail merge for mailing labels or letters and a web page advertising their products
- prepare a presentation of information of material studied in another course (e.g. a geographical information system or spreadsheets and statistics used with a study in geography, psychology or science).

**Suggested Project Structure**

1. Define the project – a definitive statement of client/personal requirements and the aim of the project. In some instances the task may be dealing with numbers of small tasks from clients in a support environment
2. Planning and time management (e.g. planning and defining sub tasks, management of tasks among a team. Managing evaluation and accuracy checks (data validation and proof reading))
3. Team roles – as appropriate
4. Resource preparation and relevant research (e.g. communicating with clients, gathering and assembling data and other resources)
5. Development of the project
6. Testing and evaluation – hardware and software testing, client polling/feedback
7. Project implementation – as appropriate and including documentation of the system or service.

PUBLISHING

Important elements of a publishing project include accurate and appropriate content, and demonstrating an understanding of typographic design and regard for the intended audience.

Electronic projects can be broadly distinguished from multimedia projects in that they do not have a particular requirement for interactivity.

Paper based publishing could include, for example, a regular college or club newsletter, a substantial booklet or magazine, course outlines for new learners, a product catalogue or a series of advertising brochures.

A suite of publishing activities that support a theme could include:

- preparation of masthead

- business card
- web page
- promotional brochures for a small business or an event.

Electronic publishing could include:

- an integrated set of web pages
- an electronic slide presentation to support a discussion or tutorial.

**Suggested Project Structure**

1. Define the project – a definitive statement of client/personal requirements and the aim of the project
2. Planning (e.g. time management, design – master layout, page design, list required content, images, video, etc... List research tasks to be completed)
3. Team roles – as appropriate
4. Resource preparation and relevant research – collect content, prepare images, etc...
5. Development of the project
6. Testing and evaluation – proof reading
7. Project implementation
8. Project presentation/distribution/publishing – printing out and collating or publishing on an electronic platform.

MULTIMEDIA

Elements of the multimedia project could be:

- projects contain accurate and appropriate content, and demonstrate an understanding of planning and development techniques
- user interface design and regard for the intended audience
- a number of media (graphics, sound, video, images, animation and text)
- interactive projects (beyond simple navigation interaction).

Multimedia projects can be distinguished from electronic publishing projects in that they have a requirement for interactivity:

- development of a coherent web site with opportunity of user interaction
- development of an interactive project using a multimedia authoring package.

**Suggested Project Structure**

1. Define the project – a definitive statement of client/personal requirements and the aim of the project
2. Planning – (e.g. time and management, organising team roles, design – storyboard , page layout, resources – content, images, video, etc...) List research tasks to be completed
3. Team roles – as appropriate
4. Resource preparation and relevant research – collect content, digitise and edit media resources, research
5. Development of the project
6. Testing and evaluation – seeking peer and audience feedback
7. Project implementation – with documentation where applicable
8. Project presentation/distribution/publishing – present, publish on web site or burn CD.

SYSTEM MANAGEMENT AND SUPPORT

Important elements of the System Management and Support Project include that they are 'hands-on' and involve research, particularly on the web (e.g. upgrade or software information or help).

Some project examples:

- restore and re-deploy old computers
- set up and implement Internet services
- set up and configure a small network
- set up and operate a support service for a class or group of users.

**Suggested Project Structure**

1. Define the project – a definitive statement of client/personal requirements and the aim of the project. In some instances the task may be dealing with numbers of small tasks from clients in a support environment
2. Planning and time management (e.g. planning a network and defining sub tasks, management of numbers of small tasks among a team, setting up procedures to document and deal with numbers of support tasks)
3. Team roles – as appropriate
4. Resource preparation and relevant research (e.g. Internet research, assembling required hardware and software)
5. Development of the project or implementing the support service
6. Testing and evaluation – hardware and software testing, client polling/feedback
7. Project implementation – as appropriate and including documentation of the system or service

PROGRAMMING AND CONTROL

The Programming and Control Project could provide learners with an opportunity to complete a programming project. Projects could range from 'traditional programming' to scripting for web pages, developing sophisticated macros or programming to control external devices (e.g. Lego, robots). Documentation would be an integral part of the completed project.

**Suggested Project Structure**

1. Define the project – definitive statement of the aim(s) of the project(s)
2. Planning (e.g. time management, flowchart, storyboard, interface design as appropriate)
3. Team roles – as appropriate. For example, in a programming environment this might take the form of supportive problem solving and evaluation
4. Resource preparation and relevant research – as appropriate. This might include gathering language manuals, preparing spreadsheet or database for macro application, building a device for use in the control context, joining a mailing list relevant to the programming language being studied
5. Development of the project

6. Testing and evaluation – programs should be thoroughly tested and bug free
7. Project implementation – as appropriate and including completed documentation and/or a user manual.

**Supporting documents including external assessment material**

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