# COLUMBA COLLEGE YEAR 11 DIGITAL TECHNOLOGY
# COURSE OUTLINE AND INFORMATION BOOKLET

## QUALIFICATIONS

NCEA – Level 1 Digital Technology

## LENGTH OF COURSE

Five (50-minute) periods per week for the full year

## COURSE DESCRIPTION

Year 11 Digital Technology (NCEA Level 1) extends the knowledge and skills learned in Year 10 Digital Technology. Students will strengthen core knowledge related to the management of digital information, including ethical issues relating to use of digital information and the key features of operating systems and application software. Students will develop skills and knowledge of tools and techniques in the areas of digital information, digital media and computer programming. Students will apply their knowledge and skill as they are engaged in technological practice to develop their own computer game and related promotional materials.

## TECHNOLOGICAL PRACTICE AND DIGITAL TECHNOLOGY KNOWLEDGE/SKILL DEVELOPMENT THEME: COMPUTER GAME DEVELOPMENT

Technological practice and digital technology knowledge/skill development will be interwoven throughout the year's programme as follows:

**Determine stakeholders preferences in computer games**

- Design and create survey (word processing/layout and design skills)
- Create database to hold survey data, use queries to analyse results and select final stakeholders (database skills)
- Create mail merge to pitch top 3 game ideas to final stakeholders (integrate database and word processing skills)

**Refine brief for computer game and develop working prototype**

- Plan computer game/refine brief
- Trial and select resources
- Write computer game code (computer programming skills)
- Trial and select programming techniques
- Test game functionality (computer programming skills)
- Gather stakeholder feedback and evaluate prototype

**Develop concept for computer game logo and create marketing materials for the game**

- Explore/analyse exisiting solutions
- Develop concepts
- Select concept (with stakeholder feedback)
- Create logo (vector graphics skills)
- Create dvd cover, game review or instruction manual (desktop publishing skills)

## LEARNING/ACHIEVMENT OBJECTIVES

### DIGITAL TECHNOLOGY LEARNING OBJECTIVES*:*

- Demonstrate understanding of basic concepts of information management

  *Students will:*

  - understand the purpose of using efficient and effective file management procedures (including management of threats to data) and implement these procedures in the management of their own digital information.
  - identify and describe the key features of operating systems and understand the role of operating systems in range of common devices (desktops, laptops, game consoles, cell phones, etc.)
  - identify and describe the key features of a range of application software packages and justify why particular application software is most suitable for a given task.
  - demonstrate an understanding of how application software and operating system software interact both in general and in the context of development of their own outcomes.
  - describe ethical issues related to the management of digital information.

- Implement a digital information outcome

  *Students will:*

  - apply techniques which demonstrate efficiency in both word processing and database applications to create an outcome which meets a set of specifications.
  - ensure the accuracy of an outcome through the implementation of data integrity and testing procedures.
  - demonstrate the ability to efficiently combine data between word processing and database applications.
  - describe commonly accepted document design principles and apply those principles when developing digital information outcomes.
  - demonstrate adherence to ethical guidelines when developing digital information outcomes.

- Implement a digital media outcome

  *Students will:*

  - apply techniques which demonstrate efficiency in both vector drawing and desktop publishing software applications to create an outcome which meets a set of specifications.
  - ensure the accuracy of an outcome through the implementation of data integrity and testing procedures.
  - demonstrate the ability to effectively combine media between vector graphics and desktop publishing applications.
  - describe commonly accepted document design principles and apply those principles when developing digital media outcomes.
  - demonstrate adherence to ethical guidelines when developing digital media outcomes.

- Construct a computer program

  *Students will:*

  - create a computer program that includes multiple data types, expressions, sequence, selection and iteration control structures and uses input from keyboard or mouse events to meet a set of specifications.
  - ensure the accuracy of the program through the implementation of thorough testing procedures.

## GENERIC TECHNOLOGY ACHIEVEMENT OBJECTIVES:

- Brief Development (N.B. - not summatively assessed)
  *Students will:*
  - use stakeholder feedback to inform decision making.
  - refine a given brief based on research (including stakeholder feedback) and conceptual development.
  - use a brief to guide development of an outcome and to evaluate the outcome's fitness for purpose.

- Outcome Development and Evaluation
  *Students will:*
  - use research, analysis and trialling to inform selection of resources, tools and techniques for developing an outcome.
  - apply tools and techniques to produce an outcome (prototype) which is fit for purpose.
  - evaluate an outcome's fitness for purpose based on the specifications of a brief, testing in situ and stakeholder feedback.

- Conceptual Design Development (N.B. - not summatively assessed)
  *Students will:*
  - Use various forms of modelling to as appropriate to the outcome (e.g. layout sketches, mock-ups, storyboards, flow charts, diagrams).
  - research and analyse existing solutions to develop design ideas.
  - develop concept sketches based on research into existing solutions and to meet specifications.
  - select concepts using stakeholder feedback and evaluation against specifications.

## KEY COMPETENCY LEARNING OBJECTIVES:

- Managing Self - *Students will:*
  - demonstrate independence by using self-directed problem-solving when encountering issues relating to solution development.
  - use resources effectively and efficiently when developing outcomes.
  - meet deadlines and milestones in projects.
  - recognize the importance of appropriate/ethical use of technologies.
  - use an appropriate data management strategies in organisation of both digital and non-digital work.

- Relating to Others - *Students will:*
  - acknowledge and incorporate different viewpoints (stakeholder, teacher, others)
  - be adaptable and open to new ideas, with feedback on outcomes

- Participating and Contributing - *Students will:*
  - Provide evaluation and reflection on others' work

- Using Language, Symbols and Texts - *Students will:*
  - Use software to design, create and export language symbols and text
  - Communicate effectively using a variety of forms and mediums (visual diaries, developing models, written and oral communication with stakeholders)
  - Interpret and transform data
  - Develop and make meaning from codes, language, and symbols specific to the technological context
  - Access and process information to inform an outcome

- Thinking - *Students will:*
  - Use creativity and innovation to create appropriate outcomes
  - Research and analyse other technologists' practice or other situations
  - Develop technological knowledge, make decisions, construct own knowledge
  - build evaluation and reflection skills

## BENEFITS:

Year 11 Digital Technology allows students to develop an excellent foundation of research, design, problem solving and digital technology skills which will complement many areas of tertiary study (Computer Science, Information Science, Design, Business Administration, and Engineering).

## INTERNAL ASSESSMENT POLICIES AND PROCEDURES

### METHODS AND TIMING

Assessment tasks are portfolio based (research, planning, documentation, creation of final outcome using digital technology skills). Please see the Year Planner and Assessment Schedule below for an overview of the assessment programme. *Note: Progress through the course and changes to the school calendar make rigid date setting for internally assessed standards impractical, therefore some flexibility in timings must be accepted. Where changes occur to dates, no less than seven days notice will be given*.

### SUBMITTING ASSESSMENTS

Assessments will be submitted for marking on the day due, at the end of the period designated in advance. For the portfolio based tasks, all research, planning, written/printed information should be organized an A4 clear file for marking. Computer files must be copied to the appropriate folder in the Student Drop Boxes (B: Drive).

### REASSESSMENT/RESUBMISSION OPPORTUNITIES

There will be **no reassessment opportunities** on Achievement Standards for the class. However, there will be **one** resubmission opportunity. A **resubmission** will only be offered when a student could achieve a grade if they correct errors or omissions in their work in a short period of time. If the resubmission is not completed by the designated due date, the original grade earned for the standard will be awarded.

### MODERATION

All internal assessments will be marked by your Year 11 Digital Technology teacher. A sample of work will be cross-marked by the other Year 11 Digital Technologies Teacher (i.e. teachers will cross-mark class work to ensure consistency of marking). When necessary, teachers from other schools may be utilised for check marking. Some work may be sent to NZQA for external moderation as required. Samples of students' work will be retained for benchmarking standards from one year to another.

### AUTHENTICITY

Authenticity of your work is of prime importance. Where secondary information is used, referencing and acknowledgement will be required or a **Not Achieved** grade will be awarded. Clear evidence of copying another student's work will lead to a **Not Achieved** grade. Please refer to the Columba College NCEA/NQF Student handbook for detailed guidelines on authenticity.

## ASSESSMENTS

*Note: the external achievement standard is a submitted report which is due at the beginning of term 4. There are no external exams.*

| | Standard | Version | Title | Level | Credits |
|---|---|---|---|---|---|
| **Internally Assessed Standards** | AS91047 (GT 1.4) | 1 | Undertake development to make a prototype to address a brief | 1 | 6 |
| | AS91071 (DT 1.41) | 1 | Implement basic procedures to produce a specified digital information outcome | 1 | 4 |
| | AS91073 (DT 1.43) | 1 | Implement basic procedures to produce a specified digital media outcome | 1 | 4 |
| | AS91076 (DT 1.46) | 1 | Construct a basic computer program for a specified task | 1 | 3 |
| **Externally Assessed Standards** | AS91070 (DT 1.40) | 1 | Demonstrate understanding of basic concepts of information management | 1 | 3 |
| | | | Total Credits | | 20 |

## RECORD OF INTERNAL ASSESSMENT GRADES

NAME:

| | Standard | Credits | Title | Grade | Signature |
|---|---|---|---|---|---|
| **Internal Achievement Standards** | AS91047 (GT 1.4) | 6 | Undertake development to make a prototype to address a brief | | |
| | AS91071 (DT 1.41) | 4 | Implement basic procedures to produce a specified digital information outcome | | |
| | AS91073 (DT 1.43) | 4 | Implement basic procedures to produce a specified digital media outcome | | |
| | AS91076 (DT 1.46) | 3 | Construct a basic computer program for a specified task | | |

# YEAR 11 DIGITAL TECHNOLOGY YEAR PLANNER
# THEME – COMPUTER GAMES

## OVERVIEW

Throughout the year, you will be gathering evidence in your visual diary and e-diary of the knowledge and skills you are developing in the areas of Digital Information, Programming and Computer Science, Digital Media and the Technological Development Process. Your visual diary and e-diary will be collected throughout the year for both formative checkpoint marking and summative internal assessment marking. Therefore, it is important that you start from the beginning of the year keeping good notes in your visual diaries/e-diary including:

- Concept knowledge
- Skills learned (including screen shots of your process)
- Analysis of how or why you use certain tools/techniques when creating an outcome
- Ideas, brainstorms
- Sketches, doodles
- Storyboards

The external assessment for the course (DT 1.40) will be a submitted report at the end of the year which presents the knowledge and understandings you have developed throughout the year in Basic Concepts of Information Management. You will create an e-diary to document these concepts during Term One and continually add to the document throughout Terms Two and Three. You will then consolidate your knowledge into a report for external submission at the beginning of Term Four.

The theme for this year will be "***Computer Games***". All work for assessment will centre on the development of your own computer game product. During the year you will:

- Create a survey to determine computer game preferences amongst potential stakeholders, using your word processing knowledge and skills (DT 1.41/GT 1.4).
- Create a database of the information you collect from your survey of potential stakeholders in order to analyse their game preferences and select your final stakeholders, using your database knowledge and skills (DT 1.41/GT 1.4).
- Create a mail-merged document which presents three final game ideas based on your research to your final stakeholders, combining your word processing and database knowledge and skills (DT 1.41/GT 1.4).
- Plan out your computer game and refine your game brief (GT 1.4).
- Develop a computer game prototype to meet the needs of your brief through trialling, testing and stakeholder consultation, using your computer programming skills (DT 1.46) and your knowledge of the outcome development process (GT 1.4).
- Develop your own computer game logo and marketing materials for your computer game using your vector graphics skills and your knowledge of document design and layout (DT 1.43).

## MODULE ONE FOCUS – DIGITAL INFORMATION/GATHERING STAKEHOLDER PREFERENCES

**Basic Concepts of Information Management (AS 1.40)**

- Operating system software – Key Features
- Application software (Word Processing and Database)
- Ethical issues related to information management (privacy, security)
- Purpose and conventions of file management procedures and use of storage devices.
- Threats to data
- Comparing and contrasting the use of different file types for different purposes (e.g. pdf, doc, docx, odt, accdb)

**Undertake development to make a prototype to address a brief (AS 1.4)**

- Research into computer games preferences of stakeholders (e.g. genre, theme, length, lives, levels)
- Selection of key stakeholders from a wider group of stakeholders
- Using stakeholder feedback to develop game concept ideas

**Implement Basic Procedures in Digital Information (AS 1.41)**

**Word Processing**

- Purpose of WP, key features, how to improve efficiency and accuracy
- Document design principles (C.R.A.P.)
- Basic typography
- Applying page formatting features
- Applying paragraph formatting
- Creating customised styles
- Customised headers/footers
- Creating a table of contents based on custom styles
- Section breaks
- Advanced table formatting
- Creating a mail merge with a database

**Database**

- Purpose of databases, uses of databases, key terminology and features
- Creating flat file database structures
- Creating tables and setting and modifying field properties including name, data type, size and format
- Entering, editing and deleting records
- Creating user input forms
- Creating and using filters, queries and sorts to retrieve relevant information

| Week | Topic Focus | |
|---|---|---|
| **1 - 3** | ***Skill Development:*** Document Design and Word Processing<br>***Operating Systems***: Key features, school/home devices with OS<br>***Application Software***: Word processors<br>***Ethical Issues***: Sharing files, file permissions<br>***File types***: doc, docx, odt, pdf<br>***File management***: Threats to data<br><br>**Week 3: Visual Diary Checkpoint** | File management, backup procedures |
| **4-7** | ***Skill Development:*** Database<br>***Operating Systems***: MAC OS & Windows and databases applications<br>***Application Software***: Databases<br>***Ethical Issues***: Data stored in databases/privacy<br>***File types***: .accdb, mdb, mdf, myd, odb<br>***File management***: Backing up data/importance in databases<br><br>**Week 7: Visual Diary Checkpoint** | |

| Week | Topic Focus | |
|---|---|---|
| **8 - 10** | **Assessment (DT 1.41) - Portfolio submission which includes:**<br>• a survey asking Year 11 students questions about their game preferences<br>• a database to store the information collected from the survey<br>• a mail merge document which presents your top three game ideas to your final stakeholders<br>• Documentation of the process for planning, designing and creating the survey, database and mail merged "game ideas" document which demonstrates key aspects of the knowledge, techniques and testing procedures used to create the documents & database. This will consist of concept planning, screen shots, annotations. | |

## MODULE TWO FOCUS – COMPUTER PROGRAMMING/DEVELOPING A GAME PROTOTYPE

**Basic Concepts of Information Management (AS 1.40)**

- Operating system software – OS for Game Platforms
- Application software – Programming IDE's (e.g. GameMaker, Scratch, Alice)
- Ethical issues related game development (e.g. use of sprites, sounds, backgrounds, source code and violence/appropriate content)
- File naming conventions related to game resources (e.g. spr_monkey, obj_princess) and folder organisation, backups, file compression (e.g. zipping and unzipping resource files)
- Comparing and contrasting the use of different file types for different purposes (e.g. gmk, gb1, exe)

**Construct a basic computer program for a specified task (AS 1.46)**

**Computer Programming (GameMaker IDE)**

- Resources – Sprites, Rooms, Backgrounds, Sounds, Objects
- Event driven programming - Events and Actions
- Object instances
- User interaction (key press and mouse events)
- Variables and types
- Programming movement - understanding X, Y screen co-ordinates
- Object depth
- Randomisation
- Assignment and expressions
- Conditional logic
- Collision detection
- Sequence, selection, iteration
- Platform views,
- Incremental testing and debugging

**Undertake development to make a prototype (AS 1.4)**

- Develop game design concept (game idea, environment, objects, controls, storyboard, sequence diagrams, interface look, game goals) based on stakeholder feedback
- Refine brief based on design concept
- Trial/Select resources
- Develop prototype, implement brief, trialling of techniques
- Test prototype including stakeholder testing and feedback
- Finalise prototype
- Evaluate fitness for purpose against brief

| Week | Topic Focus | |
|---|---|---|
| **1 - 6** | ***Skill Development:*** Computer programming<br>***Operating Systems***: OS for Game Platforms<br>***Application Software***: Programming IDE's - GameMaker, Scratch, Alice<br>***Ethical Issues***: Use of resources and code, appropriateness of content in games<br>***File management:*** Creating automatic game backups, conventions for naming resources (e.g. spr_monkey, obj_princess) and folder organisation, file compression<br>***File types***: .gmk, .gb1, .exe | File management, backup procedures |
| **7** | ***Game Development Process - Techlink Case Study: Sidhe Interactive***<br><br>http://www.techlink.org.nz/Case-studies/Technological-practice/ICT/sidhe-interactive/index.htm<br><br>***Pre-assessment task - Create game design document***<br><br>• Target Demographic of the Game/Stakeholders<br>• Game Idea and Environment<br>• Game Resources<br>• Story Board<br>• Flowchart<br>• Final brief<br><br>**Week 7: Visual Diary Checkpoint** | |
| **8 – 11** | **Assessment (DT 1.46 and GT 1.4) - Portfolio submission which includes**:<br><br>• Game prototype in both executable and source code format<br>• Documentation showing trialling procedures regarding resources, tools, techniques and processes and the consequent decisions made about their use<br>• Documentation regarding your programming testing procedures<br>• Documentation regarding your evaluation of your prototype's fitness for purpose. | |

## MODULE THREE FOCUS – DIGITAL MEDIA/CREATING CONCEPTUAL DESIGNS

| **Basic Concepts of Information Management (AS 1.40)** | **Implement Basic Procedures in Digital Media (AS 1.43)** |
|---|---|
| • Operating system software – Installing fonts, cross-platform applications<br>• Application software – Graphics applications (Illustrator, Gimp, Photoshop, Paint) and DTP Applications (InDesign, Publisher, Pages)<br>• Ethical issues related to digital image creation/DTP (e.g. copyright, privacy, creative commons, appropriate content)<br>• File naming conventions and folder management for digital images and desktop publishing (e.g. assets folders, working files, flattened files)<br>• Comparing and contrasting the use of different file types for different purposes (e.g. vector vs. raster, .ai, .jpg, .psd, .tif, .indd, .pdf) | **Vector Graphics**<br>• Images for the print:<br>  ○ resolution of images for print and its impact on quality<br>  ○ vector vs. raster graphics<br>  ○ colour mode (CMYK in print vs. RGB for screen based documents)<br>• Creating vector graphics/illustration<br>  ○ Drawing, editing and colouring basic shapes<br>  ○ Drawing and editing paths<br>  ○ Transformations, combinations, distortion<br>  ○ Working with type<br><br>**Document Layout /DTP**<br>• Review document design principles (C.R.A.P.)<br>• Document setup/margins/columns/gutters<br>• Text frames, importing text, linking and flowing<br>• Graphic frames, placing graphics, fitting, wrapping<br>• Text formatting and basic typography (review)<br>• Paragraph formatting |
| **Conceptual Design Development (Note: not summatively assessed)**<br>• Research and analyse existing solutions to develop design ideas<br>• Develop concept sketches based on research<br>• Select concepts using stakeholder feedback | |

| **Week** | **Topic Focus** | |
|---|---|---|
| **1 - 7** | ***Skill Development:*** Vector graphics, Document Layout/DTP<br>***Operating Systems***: Installing fonts, Compatibility of graphics software and files across operating systems<br>***Application Software***: Vector drawing and desktop publishing applications<br>***Ethical Issues***: Copyright, intellectual property, privacy, appropriate content<br>***File types***: vector vs. raster, .ai, .jpg. psd, .tif, .indd, .pdf<br><br>**Week 6: Visual Diary Checkpoint** | File management, backup procedures |
| **8 - 10** | **Assessment (DT 1.43) - Portfolio submission which includes**:<br>• Logo developed for the game using vector graphic software<br>• A multi-page desktop published document which incorporates the logo (either a DVD/CD box cover, game review article for a magazine, or instruction manual)<br>• Documentation of the process for creating the logo and promotional materials which demonstrates key aspects of the knowledge, techniques and testing procedures used to create the materials. This will consist of concept planning, screen shots, annotations. | |

## EXTERNAL ASSESSMENT (AS 1.40) – WRITTEN REPORT SUBMISSION

During Level 1 Digital Technology this year you will complete three major projects:

- Creating a Computer Game Survey, Database and Mail Merge Document
- Developing a Computer Game Prototype
- Developing a Logo and Marketing Materials for Your Computer Game

While creating these projects, you will be developing your *understandings of basic concepts of information management*. In your visual diary and digital files, you will record notes, document research, and record processes and considerations that demonstrate your understanding of the basic concepts of information management.

For this assessment you will create a report that discusses your *understanding of basic concepts of information management* as applied to the development of your Level 1 Digital Technology Projects throughout the year. Your report may contain descriptions, explanations, screen shots with annotations, images or diagrams. The final report must be presented as PDF document equivalent to **no more than** 14, single-sided, A4 sheets. The font must be set at Arial 12.

You will have **3 hours** during the Level 1 Digital Technology School Exams to write your draft report. You will have an additional **3 periods of supervised class** time in Term 4 to create your final report which will be sent off for external marking.