# **DT Level 1 Course Outline 3 - Context free, student-led development project**

# Guide to aid teacher planning only - designed to be printed or viewed in A3, Landscape.

## Purpose

This example Course Outline has been produced to help teachers and schools understand the new NCEA Learning and Assessment matrices and could be used to create a year-long programme of learning. It will give teachers ideas of how the new Standards might work to assess the curriculum at a particular level.

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| **Significant Learning** | **Learning activities and assessment opportunities**  Throughout the year assessment for learning happens often. Evidence may also be collected for summative assessment. | **Duration**  Total of 32 weeks |
| Prioritise user experience in design – practise manaakitanga by applying relevant design principles, mātāpono Māori, and usability principles  Understand that digital technologies, and the concepts that underpin them, are influenced by the people that create them and the contexts in which they are developed  Understand that digital technologies and the concepts that underpin them impact on people, societies, and cultures | Usability principles or mātāpono Māori  Through a range of learning activities, students learn about:   * human-computer interaction * a specific set of usability principles or mātāpono Māori * how to apply their principles or mātāpono to existing human-computer interfaces such as websites, apps, etc.   Class activities designed to help students learn what their different principles or mātāpono are and how to identify them in existing outcomes.  Class activities to help students recommend improvements to existing outcomes based on their principles or mātāpono.  Learning covered as part of this unit will contribute to the assessment of ***AS92006 Demonstrate understanding of usability in human-computer interfaces*** | 3 weeks |
| Follow a technological process to design, develop, and document digital outcomes  Investigate and consider possible digital solutions for authentic contexts or issues  Understand that digital technologies, and the concepts that underpin them, are influenced by the people that create them and the contexts in which they are developed  Understand that digital technologies and the concepts that underpin them impact on people, societies, and cultures  Evaluate the fitness for purpose of digital technologies outcomes by considering manaakitanga, kaitiakitanga and the outcomes’ social and physical environments  Prioritise user experience in design – practise manaakitanga by applying relevant design principles, mātāpono Māori, and usability principles  Use appropriate standards and conventions for digital technologies domains  Apply appropriate tools and use information from testing to improve the quality of digital technologies outcomes  Work collaboratively and engage in talanoa, korero and wānanga to share perspectives and values  Recognise that through kotahitanga and creative and critical thinking they can develop new and innovative solutions to existing problems  Understand that digital devices can collect, store, and share data, and the related ethical issues  Understand how compression enables widely used technologies to function | Mini project, teacher-led: Design and develop an outcome  This is a teacher-led project to help prepare students for the main project that follows. Teachers should lead students through the steps to design and develop a digital outcome. The context of this project could be app design, using a platform like MIT App Inventor. Teaching of relevant aspects of app design and development should happen throughout this unit as appropriate.  Through a range of learning activities, students learn about:  **Designing the outcome**   * Identifying a need or opportunity, the requirements, and potential user/s for a teacher provided context and brief. * Investigating and considering possible solutions and selecting an appropriate solution. * Creating a range of design ideas and improving them using research and feedback. * Demonstrating how the design could reflect or has been informed by manaakitanga or kaitiakitanga. * Producing a chosen design for the outcome. * Justifying the design's fitness for purpose.   **Developing the outcome**   * Acquiring the skills needed to create the outcome. * Identifying the purpose, specifications, and user requirements of the outcome. * Using the tools and techniques of a digital technologies domain to effectively produce a fit-for-purpose outcome. * Testing the outcome to ensure basic functionality and using information from testing to improve the outcome. * Working with others to trial the outcome to improve its fitness for purpose.   Class activities based on learning the basics of an app development platform like MIT App Inventor.  Class activities to help students identify needs/opportunities, requirements, specifications, users, and user requirements.  Class activities to help students identify appropriate solutions, including ensuring appropriate scope of solution ie not too big.  Class activities to help students learn about different design stages and how to use feedback and research to improve them.  Class activities for students to learn about manaakitanga or kaitiakitanga and how they can be used to inform design decisions.  Class activities for students to learn how to justify their design and final outcome for fitness for purpose.  Class activities to help students learn the tools and techniques required to develop the appropriate outcome.  Class activities to help students test the outcome and incorporate their testing to improve the outcome.  Work produced as part of this project may contribute to formative and summative assessment of ***AS92005 Develop a digital technologies outcome*** and ***AS92007 Design a digital technologies outcome*.** | 6 weeks |
| Investigate and consider possible digital solutions for authentic contexts or issues  Understand that digital technologies, and the concepts that underpin them, are influenced by the people that create them and the contexts in which they are developed  Understand that digital technologies and the concepts that underpin them impact on people, societies, and cultures  Understand how digital technologies impact on end users by considering the following mātāpono Māori: kotahitanga, whanaungatanga, manaakitanga, wairuatanga, kaitiakitanga and tikanga  Evaluate the fitness for purpose of digital technologies outcomes by considering manaakitanga, kaitiakitanga and the outcomes’ social and physical environments  Prioritise user experience in design – practise manaakitanga by applying relevant design principles, mātāpono Māori, and usability principles  Use appropriate standards and conventions for digital technologies domains  Apply appropriate tools and use information from testing to improve the quality of digital technologies outcomes  Work collaboratively and engage in talanoa, korero and wānanga to share perspectives and values  Recognise that through kotahitanga and creative and critical thinking they can develop new and innovative solutions to existing problems  Use appropriate strategies to manage their time and resources for completing a project  Be aware of relevant occupational safety and health practices | Major project, student-led: Design and develop an outcome  This is a student-led project. The context is open, and students may choose to work in a Digital Technologies domain of interest. Teachers should guide students to identify an appropriate need and possible solution.  Teachers could provide a brief for students to follow before the design stage or before the development stage to ensure the student has the chance to reach the higher Merit or Excellence grades. For example, the student could provide their own context for the design section of the project but the outcome they propose may be too “big” to achieve in the time they have so a modified proposal could be provided by the teacher for the develop part of the project. Or the student may struggle to think of a suitable context and solution, so the teacher may provide them with a brief at the start.  Students may need to acquire some new skills to successfully develop their outcomes, so time has been allocated for this. Teachers should guide students to appropriate resources that can help them learn the skills required.  **Designing the outcome**   * Identifying a need or opportunity, the requirements, and potential user/s for a teacher provided context and brief. * Investigating and considering possible solutions and selecting an appropriate solution. * Creating a range of design ideas and improving them using research and feedback. * Demonstrating how the design could reflect or has been informed by manaakitanga or kaitiakitanga. * Producing a chosen design for the outcome. * Justifying the design's fitness for purpose.   **Developing the outcome**   * Acquiring the skills needed to create the outcome. * Identifying the purpose, specifications, and user requirements of the outcome. * Using the tools and techniques of a digital technologies domain to effectively produce a fit-for-purpose outcome. * Testing the outcome to ensure basic functionality and using information from testing to improve the outcome. * Working with others to trial the outcome to improve its fitness for purpose.   Work produced as part of this project may contribute to formative and summative assessment of ***AS92005 Develop a digital technologies outcome*** and ***AS92007 Design a digital technologies outcome*.** | 11 weeks |
| Understand the nature of computation and apply appropriate reasoning about the behaviour of basic programs  Apply basic computational thinking skills (decomposition, abstraction, pattern recognition, algorithms, logic, and evaluation) to write and debug computer programs  Determine the cost (or computational complexity) of two iterative algorithms for the same problem size  Demonstrate learner agency and persevere when things fail  Anticipate and find solutions to problems | Programming Through a range of learning activities, students learn about:   * input and output * variables and data types * conditional statements * loops * collections * modular programming (with functions, methods, etc).   Class activities designed to help students learn to decompose problems into discrete parts, and to design algorithms using different methods of representation such as flowcharts or pseudocode.  Class activities to help students design and develop a series of increasingly complex programs to solve given scenarios. They document their programs with comments and follow programming ‘best practice’ which may be specific to their chosen language.  Activities designed to help students follow an organised testing process and document that they have tested their program works on a range of inputs and conditions relevant to their program.  Learning covered as part of this unit will contribute to the assessment of ***AS92004 Create a computer program.***  The timeframe includes assessment time of about 4 weeks. | 9 weeks |
| Prioritise user experience in design – practise manaakitanga by applying relevant design principles, mātāpono Māori, and usability principles  Understand that digital technologies, and the concepts that underpin them, are influenced by the people that create them and the contexts in which they are developed  Understand that digital technologies and the concepts that underpin them impact on people, societies, and cultures | Usability principles or mātāpono Māori revisit   * Return to learning and experience from across the year in the application of usability heuristics/mātāpono Māori in preparation for the CAA * Generate screenshots (as allowed) of an interface they have reviewed to take into CAA.   Learning covered as part of this unit will lead into learners sitting the ***AS92006* *Demonstrate understanding of usability in human-computer interfaces***. | 3 weeks |