UNIT OUTLINE

Unit Code: CR192

Unit Title: Introduction to Technologies

Semester: 2

Year: 2020

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CHC

CHRISTIAN HERITAGE COLLEGE

Unit code	**CR192**
Unit name	**Introduction to Technologies**
Associated higher education awards	Bachelor of Education (Primary)
Duration	One Semester
Level	Level 7
Unit coordinator	Peter Collins
Core/elective	Core
Weighting	Unit credit points: 10 Course credit points: 320 - Bachelor of Education (Primary)
Delivery mode	On-campus/Online
Student workload	Contact hours/Directed Study 30 hours Reading, study, preparation 50 hours Assignment preparation 70 hours **TOTAL** **150 hours**
	Students requiring additional English language support are expected to undertake an additional one hour per week.
Prerequisites/ co-requisites/ restrictions	Nil.
Rationale	***Enduring Understanding:*** Effective primary teachers are confident in the use and application of technologies as well as proficient in a range of pedagogies that motivate learners to explore sustainability in God's creation. This unit is designed to assist pre-service teachers to develop a deeper understanding of technology integration, digital technology processes and Design Technology within a practical-based and applied framework. Technology strands of Knowledge and Understanding, and Process and Production Skills will be elaborated within both sub-disciplines utilising the Technological Pedagogical Content Knowledge (TPACK) model as a framing tool. Pre-service teachers will be equipped to design learning goals, pedagogical practices, strategies and resources to engage, support and assess learning development in Technology in primary (Years Prep- 6) contexts.
Learning delivery process	Interactive engagement through on-campus or online learning modes with full access to CHC's learning portal of resources: **On-Campus mode** • Weekly lecture. • Weekly tutorial (where applicable).

	Plus, CHC learning portal resources (see below).
	On-line mode
	- CHC learning portal (Moodle™) including: - Synchronous and asynchronous virtual lectures (multi-user collaborative learning interfaces, lecture capture, interactive Power Point presentation and resources) - lecture capture recordings bank - weekly readings; - learning guides; - assessment guides - Collaborative forums: Student forums and News forum. - Turnitin assessment and feedback tool.
	All unit outlines are reviewed prior to the offering of the unit to take account of student and lecturer feedback.

Content	1. Australian Technologies curriculum: (i) Digital Technology and (ii) Design and Technology for Years Prep-2 and Years 3-6.
	
	2. Digital Technology:
	  2.1 Digital systems, software, hardware, networks and interaction
	  2.2 Computational thinking:
	   • Logically
	   • Algorithmically
	   • Recursively
	   • Abstractly
	  2.3 Digital coding languages: visual programming and simple script coding.
	  2.4 Coding applications including; Blockly, Hopscotch, Scratch, Sphero.
	
	3. Strategic use of digital technology to enhance and support learning and engage learners.
	
	4. Critically reflect on current pedagogies in the context of technology frameworks (TPACK, MPF, Learning by Design).
	
	5. Current trends and developments in Digital Technology within P-6 educational contexts:
	  5.1 Importance of Coding Skills and Computational Thinking
	  5.2 appification and gamification
	  5.3 one-to-one device learning
	  5.4 ICT rich curriculum embedment
	
	6. Design and Technology Curriculum:
	  6.1 Curriculum strands: Knowledge and Understanding
	   • Engineering principles and systems
	   • Food and fibre production
	   • Materials and technologies specialisations
	  6.2 Curriculum strands: Processes and production skills:
	   • Design thinking skill development
	   • Generating and designing cycle
	   • Producing and implementing
	   • Evaluating
	   • Collaborating and managing
	7. Design thinking:
	  7.1 problem-solving,
	  7.2 creativity
	  7.3 conceptualisation
	  7.4 development
	  7.5 refinement

	8. Technology and society: Inter-relationships, inter-dependence and impacts. Contemporary examples including, communication, media, motor vehicles, mobile phones and robotics. **9.** Current trends and developments in the Technology curriculum within educational. **10.** Project, and Problem-based learning as technology integrating pedagogies. **11.** Christian worldview perspectives. **12.** Digital citizenship: Safe, responsible and ethical use of technology and ICTs.
Learning Outcomes	On completion of this unit, pre-service teachers will have provided evidence that they have: **1.** evaluated current national and state-based curriculum imperatives for teaching, learning and assessment Digital Technology and Design Technologies in primary (Years Prep-2 and Years 3-6) contexts Graduate Teacher Standards: 1.1, 2.1, 2.6, 5.1 Graduate Attributes: 1, 3, 4 **2.** examined theoretical approaches, propositions, and conclusions regarding the praxis of technological application and innovation which informs pedagogical practice and assessment, in the light of contemporary theory, educational research, and achievement data; Graduate Teacher Standards: 2.1, 5.1, 5.2 Graduate Attributes: 1, 3, 4 **3.** critiqued a range of ICT resources, learning frameworks including TPACK, MPF that engage diverse learners; Graduate Teacher Standards: 2.1, 5.1, 5.2 Graduate Attributes: 1, 3, 4, 5 **4.** developed and demonstrated critical thinking skills through the application of Computational Thinking and Design Thinking from tasks drawn from the P-2 and 3-6 Technologies curriculum Graduate Teacher Standards: 2.1, 2.3, 2.6, 4.4, 4.5 Gradutate Attributes: 1, 3, 4 **5.** synthesised knowledge and practices of digital technology and design technology to develop an integrated project-based learning experience incorporating the use of ICT to expand student learning opportunities; Graduate Teacher Standards: 2.1, 2.2, 2.3, 2.5, 2.6, 3.1, 3.2, 3.3, 4.4, Graduate Attributes: 1-7 **6.** designed safe, responsible, ethical and culturally inclusive teaching and learning goals, pedagogical practices, strategies and resources that engage, support and assess learning and development in Technology and in primary contexts which are informed by a Christian worldview perspective: Graduate Teacher Standards: 1.2, 1.3, 1.6, 2.1, 2.2, 2.3, 2.5, 2.6, 3.1, 3.2, 3.3, 3.5, 4.1, 4.4, 4.5, 7.1, 7.2 Graduate Attributes: 1-7 **7.** communicated at an appropriate tertiary standard, with special attention to design elements, grammar usage, logical relations, style, referencing and presentation. Graduate Attributes: 6

Assessment tasks	**Task 1: Digital Technology**
	Construct a digital animated object using a contemporary education coding application or tool. Detail the coding construction design elements of the animated object. Include an appendix topic on the safe and ethical use of ICTs within a primary educational context.
	• Animated digital object
	• Coding information and design features
	• Safe and ethical use of ICT
	Word Length/Duration: 1,000 word + digital animation
	Weighting: 25%
	Assessed: Week 5
	Task 2: Technology Learning Activity Sequence
	Develop an outline for a learning activity inclusive of resources, suitable for a Years Prep-2 context, which explores an Australian Curriculum Design and Technology content area. Devise experiences which intentionally develop critical thinking through the use of design principles within students.
	Components:
	• Rationale
	• Australian Curriculum alignment
	• Activity plan
	• Design principles
	Word Length/Duration: 1,000 words + activity plan
	Weighting: 25%
	Assessed: Week 8
	Task 3: Technology Group Project
	In a small group respond to an environmental/resource issue from a Christian worldview sustainability perspective. Produce an integrated technology-led inquiry in a project format which would be applicable to an upper primary (Years 3-6) content area paying attention to risk management in the project design.
	Project will be presented within a booth at the "Environmental Technology Expo".
	Minimum requirements;
	• Environmental issue/problem elaboration including Christian perspectives
	• Communication of technological solution
	• Technological / practical model
	• Documentation of model design and production processes
	• Digital interface
	Word Length/Duration: 2,000 words (equivalent)
	Weighting: 50%
	Assessed: Week 13

Assessment alignment	**Assessment Task**	**Learning Outcome**	**Content**	**Graduate Teacher Standards**

	Task 1	1-6	1, 2, 3, 4, 5, 10, 12	1.1, 1.2, 2.1 ,2.6, 3.3, 3.4, 4.4, 4.5, 6.1, 6.4
	Task 2	1, 2, 3, 6	1, 7, 8, 9, 10	1.1, 2.1, 2.2, 2.3, 2.5, 3.1, 3.2, 3.3, 3.4, 5.1, 5.2
	Task 3	1-6	1-12	1.1, 2.1, 2.2, 2.3, 2.5, 2.6, 3.1, 3.2, 3.3, 3.4, 3.5, 4.4, 4.5, 7.1, 7.2

Assessment elaboration	**Task 1: Digital Technology** In class we will explore and use a variety of digital coding applications, including Blockly, Scratch, Rapid Router and Sphero. This assessment is the end result of this exploration. You will code the motion of a digital object/animation (person, car, robot or ball) using one of the above applications. (You may use an alternate if you wish). The task has three elements 1. Submitting the completed animation via a link 2. Documenting the coding steps and explaining the coding logic, critical thinking and key design components 3. A separate section discussing safe and ethical use of ICT pertinent to primary students (1000 words) **Task 2: Technology Learning Activity Sequence** The aim of the lesson is to develop design thinking skills within student so select resources and structure your lesson to draw out his aspect. (Design process skills and steps are expressed on our web page). Select a Design Technology content area from the Australian Curriculum within a P-2-year level. Use the CHC lesson template to construct an extended lesson (90-120 min) which will fit within this content area. The components of the assessment are; **Activity Rational**: Justify and discuss the intentional design process elements within your lesson structure and resource selection. (500-600 words). **Australian Curriculum alignment**: Demonstrate the alignment of your lesson with the content and processes within your selected year level to the descriptors within the Australian Curriculum. (400-50 words). **Activity plan**: Use the standard CHC lesson plan template as a guide to show the sequence of your proposed activity and use of resources. **Task 3: Technology Group Project** The aim of this project is to produce an integrated inquiry which explores an environmental issue and presents a possible technological solution. The format is an expo booth and therefore it is highly visual rather than extensive writing. Your group will be supplied with a table and wall space behind it. Review the rubric to understand the assessment criteria and guide your focus.

This assessment is combined with CR171 therefore both the Science and Technology should be covered This is a group task, therefore allocate sub-tasks to spread the load.

Group member	Task	Components
1	Environmental Issue	Issue description (Science) Christian perspective Proposed solution/action
2	Technological solution	Technology Solution Design process for model construction Risk management
3	Technology model	Physical model Design features/components
4	Digital presentation	Rolling ppt or Webpage or Interactive or Video or Combination
All	Set up booth	Themes and visual elements

		CR192 Introduction to Technologies: Task 1 Animated digital object				
	Name:		**Lecturer:**			**Semester 2**
LOs	**Criteria**	**High Distinction**	**Distinction**	**Credit**	**Pass**	**Fail**
4	*1. Demonstration of digital object.*	Very high-quality model/ physical demonstration which accurately performs the task and displays creativity/innovation to a superior level.	High-quality model/ physical demonstration which accurately performs the task and displays creativity/innovation to an advanced level.	The model/ physical demonstration accurately performs the task and displays elements of creativity/innovation.	The model/ physical demonstration performs the task but displays minor creativity/innovation.	The model fails to perform the task adequately.
1, 2	*2. Digital coding information and design elements.*	Very high quality and accurate coding information and communication of the design elements.	High quality and accurate coding information and communication of the design elements.	Accurate coding information and communication of the design elements.	Adequate, but with minor lapses, coding information and communication of the design elements.	Limited communication of the coding information and design elements.
5	*3. Safe & ethical use of ICT.*	Comprehensive discussion and analysis of issue, with academic justification, clearly linked to the learner phases (P-2, 3-6).	Well-structured discussion and analysis of issue, with academic justification, linked to the learner phases (P-2, 3-6).	Logical discussion and analysis of issue, with academic justification, generally linked to the learner phases (P-2, 3-6).	Adequate discussion and analysis of issue, with some academic justification and general/minor link to learner phases.	Inadequate discussion and analysis of issue with limited link to learner phases.
6	*4. Communication and academic writing standards and conventions.*	Written communication consistently and accurately controls the conventions of academic writing to create a high quality of meaning.	Written communication consistently and accurately controls the conventions of academic writing to create a quality of meaning.	Written communication consistently and accurately controls the conventions of academic writing to create a sound level of meaningful.	Written communication controls the conventions of academic writing with minor lapses to create a generalized meaning.	Written communication lacks satisfactory controls of academic conventions to create inadequate meaning.
	COMMENTS					**RESULT**

		CR192 Introduction to Technologies: Task 2 Technology Lesson				
	Name:		**Lecturer:**			**Semester 2**
LOs	**Criteria**	**High Distinction**	**Distinction**	**Credit**	**Pass**	**Fail**
1, 2	**1.Technology learning activity rationale and linkage to design principles.**	Well expressed and logical rationale displaying deep engagement with design principles.	Well expressed and logical rationale displaying strong engagement with design principles.	Well expressed and logical rationale displaying engagement with design principles.	Logical rationale displaying adequate engagement with design principles.	Inadequate rational and/or limited linkage to design principles.
2, 3	**2. Technology learning activity plan.**	Well-structured plan with clear goals, engaging activities and logical sequence which develops a rich understanding of design principles. Lesson is suitable for the learning phase and achievable in the classroom context.	Well-structured plan with clear goals, engaging activities and logical sequence which develops an understanding of design principles. Lesson is suitable for the learning phase and achievable in the classroom context.	Plan contains goals, activities and elements which develop an understanding of design principles. Lesson is suitable for the learning phase and achievable in the classroom context.	Plan contains goals, activities and elements which develop a general understanding of design principles. Lesson is suitable for the learning phase and achievable in the classroom context with minor modification.	Plan displays limited development of design principles and/or is not achievable in the classroom context.
1, 2	**3. Lesson alignment with Australian Curriculum content and processes.**	Comprehensively aligns and elaborates both content and process within the Design Technology curriculum.	Aligns and elaborates both content and process within the Design Technology curriculum.	Aligns and incorporates both content and process within the Design Technology curriculum.	Generally, aligns both content and process within the Design Technology curriculum. Alternatively elaborates one element well but limited in other area.	Limited or minimal alignment for both content and process within the Design Technology curriculum.
6	**4. Communication and academic writing standards and conventions.**	Written communication consistently and accurately controls the conventions of academic writing to create a high quality of meaning.	Written communication consistently and accurately controls the conventions of academic writing to create a quality of meaning. .	Written communication consistently and accurately controls the conventions of academic writing to create a sound level of meaningful.	Written communication controls the conventions of academic writing with minor lapses to create a generalized meaning.	Written communication lacks satisfactory controls of academic conventions to create inadequate meaning.
	COMMENTS					**RESULT**

		CR192 Introduction to Technologies: Task 3 Group project				
	Name:		Lecturer:			Semester 2
LOs	Criteria	High Distinction	Distinction	Credit	Pass	Fail
1, 5	1. **Description, analysis and proposed solution of environmental topic/issue including a Christian perspective.**	Insightful and highly relevant description and analysis of the environmental issue with critical engagement of credible academic literature. Coherent and well considered Christian perspective incorporated within the project.	Highly relevant description and analysis of the environmental issue with strong engagement of credible academic literature. Considered Christian perspective incorporated within the project.	Relevant description and analysis of the environmental issue with moderate engagement of credible academic literature. Sound Christian perspective incorporated within the project.	Relevant description and lower level analysis of the environmental issue with moderate engagement of credible academic literature. Christian perspective incorporated within the project but of a weaker standard.	Inadequate description and/or poor analysis of the environmental issue with limited engagement of credible academic literature. A limited/omission of a Christian perspective.
2, 3	2. **Demonstration and explanation of technological model component of the solution.**	Comprehensive explanation of technological solution with a high-quality model/ physical demonstration.	Detailed and relevant explanation of technological solution with a quality model/demonstration.	Relevant explanation of technological solution with a working model/demonstration.	Satisfactory explanation of technological solution with a working model/demonstration.	Inappropriate/ inadequate explanation of technological solution with a poor model/demonstration.

5	**3. Technology design process documentation including risk management considerations.**	High quality and accurate communication of the design process elements of imagination, planning, analysis, and modification. Risk management well considered.	Accurate and clear communication of the design process elements of imagination, planning, analysis, and modification. Risk management well considered.	Accurate communication of the design process elements of imagination, planning, analysis, and modification. Risk management considered.	Adequate but lapses in the communication of the design process elements of imagination, planning, analysis, and modification. Risk management considered.	Limited communication of the design process elements of imagination, planning, analysis, and modification.
4, 6	**4. Communication and presentation:** • **Expo format** • **Academic standards** • **Oral presentation** • **Project engagement and cohesion.**	Project of a very high presentation standard to create an exceptional quality of meaning. Written communication consistently and accurately controls the conventions of academic writing Confident and engaging oral communication.	Project of a high presentation standard to create a quality of meaning. Written communication accurately controls the conventions of academic writing. Confident oral communication.	Project of a sound presentation standard which is meaningful. Written communication controls the conventions of academic writing. Sound oral communication.	Project of a sound presentation standard which is generally meaningful. Written communication controls the conventions of academic writing with minor lapses. Oral communication generally sound but disjointed in places.	Project of a presentation standard which does not adequately create meaning. Written communication lacks satisfactory controls of academic conventions. Oral communication of a poor quality.
	COMMENTS					**RESULT**

Prescribed text(s)	Nil. Selected readings will be available via the Moodle™ site for this unit.
Recommended readings	**Curriculum Readings** Dickson, R. (2019). *Coding for beginners using Scratch: simple coding for absolute beginners*. Revised & updated ed. London: Usborne Pub. Fleer, M. (2016). *Technologies for Children.* Sydney, Cambridge University Press. Moomaw, S. (2013). *Teaching STEM in the early years: Activities for integrating science, technology, engineering, and mathematics.* St Paul, MN: Redleaf Press. Teachers learning code (n.d.) *How to guide for beginners.* online-pdf available at http://teacherslearningcode.com/assets/TLC-gettingstartedguide.pdf Vasquez, J. Sneider, C. & Comer, M. (2013). *STEM lesson essentials, grades 3-8: Integrating science, technology, engineering, and mathematics* Portsmouth, NH: Heinemann. **Websites** Commonwealth Scientific and Industrial Research Organisation: Scootle Science: https://www.scootle.edu.au/ec/search?q=science&field=title&field=text.all&field=topic Curriculum into the Classroom (C2C): http://education.qld.gov.au/c2c/ Code for life education: https://www.codeforlife.education/ DATTA: Australia Design and technology teachers association: http://dattaaustralia.com/ D&T the design and technology association: https://www.data.org.uk/for-education/primary/ Digital Technologies Hub: https://www.digitaltechnologieshub.edu.au/ Osbourne quicklinks: Scratch: https://www.usborne.com/quicklinks/eng/catalogue/catalogue.aspx?cat=1&loc=uk&id=9569 Schools of the future STEM strategy (2016): http://www.education.qld.gov.au/stem/pdfs/strategy-for-stem.pdf Teaching teachers for the future: http://www.ttf.edu.au/ In addition to the resources above, students should have access to a Bible, preferably a modern translation such as The Holy Bible: The New International Version 2011 (NIV 2011) or The Holy Bible: New King James Version (NKJV). These and other translations may be accessed free on-line at http://www.biblegateway.com. The Bible app from LifeChurch.tv is also available free for smart phones and tablet devices.
Specialist resource requirements	Nil.