



**Draft Shape of the ACT Board of Senior Secondary Studies
Curriculum: Technologies**

For public consultation

May 2018

Acknowledgment of the cross-sector working party

A cross-sector working party of eight teachers provided advice on development of courses written under the Technologies framework.

Name	College

Purpose

The *Shape of the BSSS Senior Secondary Curriculum: Technologies* provides broad direction on the purpose, structure and organisation of courses written under the Technologies Framework.

It is intended to guide the writing of senior secondary courses for Years 11 and 12. This paper has been prepared following analysis of the ACARA Shape of the Australian Curriculum: Technologies paper, an environmental scan of curriculum across jurisdictions and mapping of BSSS accredited courses for duplication of content.

This paper should be read in conjunction with the BSSS Shape of the ACT Senior secondary Curriculum available at (<http://www.bsss.act.edu.au/curriculum>).

Background on the Proposal

The BSSS Review of Curriculum in 2015 recommended consolidation of course frameworks where there was an educational rationale for this to occur. A number of courses centred on technology had the design aspect at their core. This design concept provided a strong basis for a common Technologies framework to be constructed. The Curriculum Assessment Committee and the Board approved the development of a single Technologies framework

A cross-sectoral committee was appointed and met to consider the construction of a new single framework to replace those which currently cover the areas of Design and Graphics, Information Technology, Engineering, and Textiles and Fashion. The group developed a new framework which met the demands of all of these and similar courses (tertiary, accredited and VET). Considerable work was undertaken in proposing new courses which may be developed under the framework for future study by ACT senior secondary students.

The Framework writing group established a rationale and goals for future focussed, flexible courses which aligned with current BSSS design specifications. Contemporary practices in assessment were considered in order to form a task type table.

Design specifications for all BSSS accredited courses

The foundation of a course comprises of four core 1.0 standard units. Core units provide students with the breadth of the subject. Units 1-4 are not sequential. Content descriptions state specific subject-based knowledge, understanding and skills. The point of difference between core units will be defined in the unit description and content descriptions. Units will not be organised by activity. Instead, units will be organised around a focus, concept or issue.

A negotiated study unit is decided upon by a class, group(s) or individual student in consultation with the teacher and with the principal's approval. This unit may be undertaken after the completion of two standard units.

Content descriptions will be written for each unit. Content descriptions specify the knowledge, understanding and skills that students are expected to learn and that teachers are expected to teach. Teachers are required to develop a program of learning that enables students to demonstrate all the content descriptions. The lens which the teacher uses to demonstrate the content descriptions will be determined by the teacher when developing their program of learning. A program of learning is what a college provides to implement the course for a subject.

Proposal	Rationale For Courses					
	Proposed suite of courses written under the Technologies Framework					
	Data Science & Informatics	Design & Emerging Technologies	Design & Graphics	Digital Technology Development	Engineering Studies	Environmental Design
classification	T	A/T/M	A/T/M	A/T/M/V	A/T	A/T/M
VET qualification inclusion	TBA	TBA	TBA	TBA	TBA	TBA
course rationale	<p>This course focuses on the application of statistics, data analysis and related methods in order to better understand design strategies and solutions.</p> <p>Since the advent of computers, individuals and organizations increasingly process information digitally.</p> <p>Data science is a "concept to unify statistics, data analysis, machine learning and their related methods" in order to "understand and analyse actual phenomena" with data.</p> <p>Informatics involves the practice of information processing and the engineering of information systems, and as an academic field it is an applied form of information science.</p> <p>The field considers the interaction between humans and information alongside the construction of interfaces, organisations, technologies and systems. As such, the field of informatics has great breadth and encompasses many subspecialties, including disciplines of computer science, information systems, information technology and statistics.</p>	<p>The design and manufacture of products is the major focus of this course which explores the use of a range of emerging materials and technology. Students learn that design theory, audience response, and design principles are reflected in design.</p> <p>Students apply the design process to address a need. Students learn that materials are the basic ingredients of technology. They explore how a wider range of materials is now available which have further encouraged the development of technology and the design of new products. Students use skills, techniques and methods to plan, construct and produce design creations. Students consider the relationship between design, society and culture.</p> <p>Design and Emerging Technology offers students a range of career pathways in design in fields such as engineering, fashion, furniture, jewellery, textile and ceramics, at both professional and vocational levels</p>	<p>The study of Design and Graphics focusses on exploring the purposeful use of technologies and creative processes to produce design solutions. Students acquire knowledge and develop skills using technologies and other processes appropriately, to design and create graphic solutions.</p> <p>Students will engage with emerging technologies, make connections with industry, and apply industry standards and practices through the development of their projects.</p> <p>Design and Graphics, provides pathways in a range of related fields such as architecture, digital 3D modelling, industrial design, engineering, interior design, graphic design, furniture design, fashion, jewellery, ceramics, textiles, and trade based careers.</p>	<p>This course focuses on design thinking and the application of the design process to create and develop practical solutions.</p> <p>Digital Technologies involves students creating new ways of doing things, generating their own ideas and creating digital solutions to problems of interest. Solutions may take the form of a product, prototype, and/or proof of concept.</p> <p>Innovation may also include students designing solutions that improve existing processes or products. Students apply problem solving skills in making appropriate design solutions. They use computational thinking skills and strategies to identify, deconstruct, and solve problems that are of interest to them. They analyse and evaluate data, test hypotheses, make decisions based on evidence, and create solutions.</p> <p>Through the study of Digital Technologies, students are encouraged to take ownership of problems and design, code, validate, and evaluate their solutions. In doing so, they develop and extend their understanding of designing and programming, including the basic constructs involved in coding, array processing, and modularisation</p> <p>This course can establish a basis for further education and employment in the IT field.</p>	<p>Engineering Studies focusses on students' utilizing an investigative and innovative design process to integrate both the creative and technical requirements of problems into the development of engineered solutions.</p> <p>Students will have the opportunity to research, problem solve, apply lateral thinking, mathematical and scientific principles, analyse and evaluate existing ideas, products, processes and solutions to problems. Students will learn to generate imaginative and creative solutions of their own. They will communicate their ideas within the parameters and requirements of engineering based tasks whilst gaining and applying knowledge of industry standards of design, manufacture and safety. This course prepares students for further study in engineering.</p>	<p>This courses focuses on the fields of architecture, interior design, urban design, landscape and sustainable building design.</p> <p>Students learn about 3D spatial design. They apply problem solving skills in making appropriate design solutions to create attractive and functional spaces such as playgrounds, buildings and galleries.</p> <p>This course considers sustainability, aesthetics, human interaction, ergonomics, the ethical use of space and functionality.</p> <p>A course of study in Environmental Design forms a pathway for further study in building design, civil engineering, and architecture, interior design, set design and landscape design, concepts design and furniture design.</p>

DRAFT PROPOSED UNIT TITLES

1st Draft Proposal	Data Science & Informatics	Design & Emerging Technologies	Design & Graphics	Digital Technology Development	Engineering Studies	Environmental Design
Unit 1	Data Representation & Analysis	Design Processes	Design Applications	Digital Asset Design and Development	Engineering Applications	Architecture
Unit 2	Information Security	Product Design	Design for Clients	Solutions Architecture and Implementation	Structural Engineering	Landscape Architecture
Unit 3	Artificial Intelligence & Machine Learning	Design for Manufacturing	Graphic Communication	System Interfaces	Mechatronic Engineering	Interior Design
Unit 4	Data Research and Thesis	Innovation and Design	Web Design	Structured Project	Engineered Products	Town Planning / Urban Design
Negotiated Unit	A negotiated study unit is decided upon by a class, group(s) or individual student in consultation with the teacher and with the Principal's approval. The program of learning for a negotiated study unit must meet all the content descriptions as appears in the unit.					

Note: VET qualifications will be explored when courses are developed.

Proposed suite of courses written under the Technologies Framework (Continued)			
	Fashion & Textiles	Networking	Software Engineering
classification	A/T/M/V	T/V	T/A
VET qualification inclusion	Cert 2 MST20616 or equivalent	TBA	TBA
course rationale	<p>This course focuses on design thinking and the application of the design process to create and develop practical solutions using textiles as a medium.</p> <p>Students learn about the fashion and textile industry by exploring; fundamentals of design, emerging technologies, fashion futures, history and culture, sustainability and ethics.</p> <p>Students apply problem solving skills in making appropriate design solutions.</p> <p>A course of study in Fashion can establish a basis for further education and employment in the design fields such as interior personal styling, fashion design, industrial design, costume design, production manufacture and textile technologies.</p>	<p>This course focuses on network architecture, the devices, media and services and operations in different types of networks.</p> <p>Students learn about the role of protocol layers in data networks, IPV4 and IPV6 addressing, and subnetting. They learn how to configure and troubleshoot network devices and resolve common issues with data link protocols.</p> <p>Students apply problem solving skills in making appropriate design solutions. They create network operations and analyse data traffic.</p> <p>Students develop skills in creating VLANS to logically separate networks, using protocols for routing such as RIP, RIPing, OSPF and EIGRP. They design ACLs for network security.</p> <p>Students become familiar with protocols such as DHCP and NAV,VTP,STP and RSTP and tunnelling for virtual private networks</p> <p>A course of study in Networking can establish a basis for further education and employment in the IT field.</p>	<p>This course focuses on the design and construction of software systems, across a range of different contexts. Students study contemporary programming languages.</p> <p>Students will investigate the methodology of software systems engineering using analysis and specification methods such as UML, XML, structured and soft systems methodologies.</p> <p>Students apply problem solving skills in making appropriate design solutions.</p> <p>Students will examine modern development environments.</p> <p>A course of study in Software Engineering can establish a basis for further education and employment in the IT field.</p>

Courses to be written under the Industry & Services Framework	
These courses are not based on the design process	
Timber Products (formerly Wood Technology)	Metal Products (formerly Metal Technology)
A/M	A/M
N/A	N/A
<p>The study of Timber Products provides opportunities for students to engage with emerging technologies, make connections with industry, apply standards and practices through the manufacturing of their timber projects.</p> <p>This course is intended to meet the needs of students who have a general interest in industrial technology trades as well as those intending to choose a career pathway into traditional timber trades and related service industries.</p> <p>Students develop relevant technical, vocational and interpersonal skills suitable for employment and further training. They can also develop skills, knowledge and experiences - such as teamwork, communication and Workplace, Health and Safety- that are transferable to other industries.</p>	<p>The study of Metal Products provides opportunities for students to engage with emerging technologies, make connections with industry, apply standards and practices through the manufacturing of their metal projects.</p> <p>This course is intended to meet the needs of students who have a general interest in industrial technology trades as well as those intending to choose a career pathway into traditional metal trades and related service industries.</p> <p>Students develop relevant technical, vocational and interpersonal skills suitable for employment and further training. They can also develop skills, knowledge and experiences - such as teamwork, communication and Workplace, Health and Safety- that are transferable to other industries.</p>

DRAFT PROPOSED UNIT TITLES

1 st Draft Proposal	Fashion & Textiles	Networking	Software Engineering
Unit 1	Design Aesthetics	Networks	Computer Science Concepts and Theory
Unit 2	Design for Purpose	Routing and Switching	Systems Analysis and Design
Unit 3	Design for Futures	Scaling Networks	Prototyping and testing
Unit 4	Design Communication	Connecting Networks	Systems Implementation and Integration
Negotiated Unit	A negotiated study unit is decided upon by a class, group(s) or individual student in consultation with the teacher and with the Principal's approval. The program of learning for a negotiated study unit must meet all the content descriptions as appears in the unit.		

Timber Products TBA	Metal Products TBA
Negotiated Unit	Negotiated Unit

Note: VET qualifications will be explored when courses are developed.

Feedback

The Board of Senior Secondary Studies (BSSS) seeks feedback on the proposed suite of courses and configuration of content. You are invited to provide feedback at: <https://www.surveymonkey.com/r/ShapeofcoursesTechnologies>

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