

**Teacher(s):** *Gavin Molyneux*

**Faculty:** *Design & Technology*

**Unit Duration:** Semester 1, 2024

The **Australian Curriculum Achievement Standards in STEM** is addressed in the Australian Curriculum through the learning areas of Science, Technologies and Mathematics, and through general capabilities, particularly Numeracy, Information and Communication Technology (ICT) capability, and Critical and Creative Thinking. Engineering is addressed in Design and Technologies through a dedicated content description at each band that focuses on engineering principles and systems. It is presented across the curriculum through Science, Digital Technologies and Mathematics. Engineering often provides a context for STEM learning.

UCHSK also acknowledges that creativity leads to innovative designed solutions that solve authentic real world problems and has integrated the design principles from Visual Art into the subject. The requirement to solve real-world problems leads to the development of personal qualities such as persistence, independence and learning from mistakes.

The 'real world' nature of studying STEM courses and the integrated approach to teaching and learning along with the collaboration required by participants develops a sense of independence and responsibility by the students.

ACARA research has shown that the benefits for students from their involvement in STEM courses include the development of general capabilities, such as Critical and Creative Thinking, and Personal and Social Capability, was overwhelmingly identified as an outcome for some students. They became evident in teamwork and collaboration, the breadth of communication skills developed and used, and the creative approaches to the project as a whole and to problem-solving in particular. Students will be challenged to 'think outside the square' and will be encouraged to take ownership of their own learning.

### **Australian Curriculum Achievement Standard:**

**UCHSK has determined that the following Science, Digital Technologies, the Visual Art, Mathematics and Design & Technology achievement standards from the Australian Curriculum for both year 9 & year 10 to formulate Essential Learnings for this subject.**

**Year 7 Science:** Designs questions that can be investigated using a range of inquiry skills.

**Year 7 Science:** Develops questions and hypotheses and independently designs and improves appropriate methods of investigation, including field work and laboratory experimentation.

**Year 7 Digital Technologies:** analyse how characteristics and properties of materials, systems, components, tools and equipment can be combined to create designed solutions ([AC9TDE10K06](#))

**Year 7 Design & Technologies:** apply innovation and enterprise skills to generate, test, iterate and communicate design ideas, processes and solutions, including using digital tools. ([AC9TDE10P02](#))

**Unit Description:** Students will be working collaboratively this semester in a problem-based learning environment.

iSTEAM is an interdisciplinary programme which is based around the concepts of problem-based learning and using the Human Centred Design Process to solve real world problems. Research suggests that providing students with problem-based learning opportunities can help them become more self-aware, creative and critical thinkers, develop leadership attributes, work collaboratively, and be innovative problem solvers of discovered real world problems. Throughout this course students will be provided opportunities to take responsibility for, and ownership of, their own learning and solving discovered real world problems.

Students are intimately involved in planning their own learning, formulating questions, investigating widely, and building new understandings, meanings and knowledge in an area that they are passionate about. In the engineering field, a design brief "Engineering Notebook" is a written work for a design project developed by a single designer or design agency for a client. Design briefs organize the process that is followed to complete a product. Students will solve a problem during the Inquiry/Engineering and Design Learning cycles of the project. They will create record of their design evolution by writing a design journal created in Google sites. Their journal will document their learning while creating a series of prototypes with evolving designs and reflecting their journey in research - design – create - test – evaluation.

**Essential Learning Outcomes developed from the Achievement Standards of the Australian Curriculum:**

**V9.DST.7.03** Creates and adapts design ideas, processes and solutions, and justifies their decisions against developed design criteria that include sustainability

**V9.DST.7.04** Communicates design ideas and solutions to audiences using technical terms and graphical representation techniques, including using digital tools

**V9.DST.7.05** Independently and collaboratively documents and manages production processes to safely produce designed solutions

**Materials and Equipment Required:** Students are expected to arrive at every class with a class book/folder to write notes for that subject, a writing instrument and a Chromebook or similar, appropriate electronic device. Students are required to provide the following additional materials and equipment: *Clear Sleeve Folder, Personal Device, Pen & Pencil.*

**Absences from Class:** Students who miss classes due to absence or excursions must negotiate with the class teacher to catch up missed work.

**Use of IT in Class:** A Google Classroom has been set up for this class. Students will be required to log into this Google Classroom regularly to access course material. Students must bring their Chromebook to all lessons, however, the use of these devices in class will be at the discretion of the teacher.

**Homework:** Any homework will be directly related to instruction and course requirements, will be assessed appropriately and may impact upon student grades. Examples of homework may include; catch up on missed classwork, revision of classwork, study for tests, assignment work, or preparation for a class presentation.

**Late Work:** Extensions may be negotiated with individual teachers before the due date

**Plagiarism:** Plagiarism is copying or using another’s work and claiming it as your own. This includes copying, cutting and pasting text or using ideas directly from a text, the internet or some other source without appropriate referencing. The use of Generative AI to produce your work, or edit it so that it no longer reflects your work, is a form of plagiarism. If this happens, work may not be graded and students will be asked to discuss the assessment with the classroom teacher and Executive Teacher for that subject. If a teacher suspects a student may have plagiarised their work they may choose to assess the student in an alternative way, such as verbally or under test conditions. Parents may be contacted as part of this process.

**Assessment Portfolio:** This contains evidence of work from the opportunities the students have been provided to demonstrate elements of the achievement standard.

**Assessment Tasks for this subject will include:**

Assessment Tasks for this subject will include:	Week / Date Due	Essential Learning
1. Safety Booklet	<b>Week 2</b>	<b>7.05</b>
2. Design Challenges	<b>Week 3</b>	<b>7.04 7.05</b>
3. Design Workbook for the Term	<b>Week 8</b>	<b>7.04 7.05</b>
4. Written Reflection on Learning	<b>Week 8</b>	<b>7.04</b>
5. Practical design-create-build application (ongoing observation)	<b>Week 9</b>	<b>7.04 7.05</b>

**A-E Reporting Grade Descriptors** These are the grades and grade descriptors for reporting at the end of each Semester.

<b>A</b>	Demonstrating <b>excellent</b> achievement of what is expected (Consistently achieving a proficiency level of 4 or above in each of the Essential Learnings)
<b>B</b>	Demonstrating a <b>high</b> achievement of what is expected (Consistently achieving a proficiency level of between 3 and 4 in each of the Essential Learnings)
<b>C</b>	Demonstrating <b>satisfactory</b> achievement of what is expected (Achieving a proficiency level of 3 across the Essential Learnings)
<b>D</b>	Demonstrating <b>partial</b> achievement of what is expected (Achieving a proficiency of between 1 and 3 across the Essential Learnings)
<b>E</b>	Demonstrating <b>limited</b> achievement of what is expected (Achieving a proficiency of 1 or less in each of the Essential Learnings)

**S Status** is awarded where unavoidable circumstances have prevented assessment. Must be negotiated with the Principal.

**Grade Descriptors and the “C” grade**

In ACT public schools the Australian Curriculum Achievement Standard is aligned with a ‘C’ grade. The ‘C’ grade indicates that your child has demonstrated a satisfactory level of knowledge, understanding and skill in relation to the Achievement Standard.

**Appeals**

A student must initiate an appeal for any grade with their subject teacher. If a student is dissatisfied with that initial process, they must pursue further appeal through the Faculty Executive Teacher for that subject.

**Executive Teacher** *Michelle Coleman*

*29/01/2024*