

# 2024 Semester 1 - Years 9/10 Unit Outline

## Robotics & Mechatronics

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**Teacher(s):** Jackie MacDougall

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**Faculty:** Arts and Technologies

**Unit Duration:** Semester

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The Australian Curriculum Achievement Standards in [Digital Technologies Years 9 & 10](#)

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### Australian Curriculum Achievement Standard

By the end of Year 10, in Design Technology, students explain how people working in design and technologies occupations consider factors that impact design decisions and the technologies used to produce products, services and environments. They identify the changes necessary to design solutions to realise the preferred futures they have described. When producing designed solutions for identified needs or opportunities, students evaluate the features of technologies and their appropriateness for purpose for one or more of the technology contexts.

By the end of Year 10, in Digital Technologies, students plan and manage digital projects using an iterative approach. They define and decompose complex problems in terms of functional and non-functional requirements. Students design and evaluate user experiences and algorithms. They design and implement modular programs, including an object-oriented program, using algorithms and data structures involving modular functions that reflect the relationships of real-world data and data entities. Students test and predict results and implement digital solutions.

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### Unit Description:

The subject aims to develop students' understanding and skills in computational thinking and problem-solving while introducing them to essential theories of constructing and programming robotics. Students will investigate the role of physical devices in computing and use App Lab and Adafruit's Circuit Playground to develop programs that utilise hardware inputs and outputs commonly found in smart devices. They will learn how a simple prototype can lead to a final product. They will explore how physical devices can respond to the world around them using a "maker" mindset and everyday materials. Moreover, the subject will delve into the ethical and moral implications of developing complex robots and Artificial Intelligence.

By the end of the course, students will have gained an in-depth understanding of robotics, programming, and ethics, equipping them with the skills and knowledge needed to tackle more advanced robotics concepts in the future.

1. AC9TDE10P01 analyse needs or opportunities for designing; develop design briefs; and investigate, analyse and select materials, systems, components, tools and equipment to create designed solutions
  2. AC9TDE10P02 apply innovation and enterprise skills to generate, test, iterate and communicate design ideas, processes and solutions, including using digital tools
  3. AC9TDI10P04 define and decompose real-world problems with design criteria and by interviewing stakeholders to create user stories
  4. AC9TDI10P07 design and prototype the user experience of a digital system
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**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 may also be required to provide the following additional materials and equipment: [Click here to enter text.](#)

**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.

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**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.

Portfolio Assessment Tasks for this subject will include	Week / Date Due	Essential Learning
1. Classwork Portfolio	Ongoing/ Week 18	1, 2, 3, 4
2. Projects:		
1) Human Device Interaction	● Week 11	1, 2, 3, 4
2) Prototype an Innovation	● Week 17	
3. Final Test	Week 18	1, 2, 3, 4

**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)
<b>S</b>	<b>Status</b> 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

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