

Curriculum links

Year 10

Digital Technologies (elective)

- Design algorithms represented diagrammatically and in structured English and validate algorithms and programs through tracing and test cases ([ACTDIP040](#))
- Implement modular programs, applying selected algorithms and data structures including using an object-oriented programming language ([ACTDIP041](#))
- Develop techniques for acquiring, storing and validating quantitative and qualitative data from a range of sources, considering privacy and security requirements ([ACTDIP036](#))
- Define and decompose real-world problems precisely, taking into account functional and non-functional requirements and including interviewing stakeholders to identify needs ([ACTDIP038](#))
- Design the user experience of a digital system by evaluating alternative designs against criteria including functionality, accessibility, usability, and aesthetics ([ACTDIP039](#))
- Evaluate critically how student solutions and existing information systems and policies, take account of future risks and sustainability and provide opportunities for innovation and enterprise ([ACTDIP042](#))

Design and Technologies (elective)

- Critically analyse factors, including social, ethical and sustainability considerations, that impact on designed solutions for global preferred futures and the complex design and production processes involved ([ACTDEK040](#))
- Explain how products, services and environments evolve with consideration of preferred futures and the impact of emerging technologies on design decisions ([ACTDEK041](#))
- Investigate and make judgements, within a range of technologies specialisations, on how technologies can be combined to create designed solutions ([ACTDEK047](#))
- Critique needs or opportunities to develop design briefs and investigate and select an increasingly sophisticated range of materials, systems, components, tools and equipment to develop design ideas ([ACTDEP048](#))
- Work flexibly to effectively and safely test, select, justify and use appropriate technologies and processes to make designed solutions ([ACTDEP050](#))

Science

- Advances in scientific understanding often rely on developments in technology and technological advances are often linked to scientific discoveries ([ACSHE158](#))([ACSHE192](#))
- People use scientific knowledge to evaluate whether they accept claims, explanations or predictions, and advances in science can affect people's lives, including generating new career opportunities ([ACSHE160](#)).
- Values and needs of contemporary society can influence the focus of scientific research ([ACSHE228](#))
- Select and use appropriate equipment, including digital technologies, to collect and record data systematically and accurately ([ACSIS166/200](#)).
- Analyse patterns and trends in data, including describing relationships between variables and identifying inconsistencies ([ACSIS203](#))

Year 11 and 12

Physics - Unit 1: Thermal, nuclear and electrical physics

- Advances in science understanding in one field can influence other areas of science, technology and engineering ([ACSPH011](#))
- The use of scientific knowledge is influenced by social, economic, cultural and ethical considerations ([ACSPH012](#))
- Scientific knowledge can be used to develop and evaluate projected economic, social and environmental impacts and to design action for sustainability ([ACSPH015](#))
- Electrical circuits enable electrical energy to be transferred efficiently over large distances and transformed into a range of other useful forms of energy including thermal and kinetic energy, and light. ([ACSPH037](#))
- Electric current is carried by discrete charge carriers; charge is conserved at all points in an electrical circuit ([ACSPH038](#))
- Circuit analysis and design involve calculation of the potential difference across, the current in, and the power supplied to, components in series, parallel and series/parallel circuits ([ACSPH044](#))

Physics - Unit 4: Revolutions in Modern Physics

- ICT and other technologies have dramatically increased the size, accuracy and geographic and temporal scope of datasets with which scientists work ([ACSPH122](#))
- Scientific knowledge can be used to develop and evaluate projected economic, social and environmental impacts and to design action for sustainability ([ACSPH128](#))

The below are electives – Senior Subjects – Technologies

Digital Solutions

Unit 1 – Creating with Code, Unit 2 – Application and data solutions, Unit 3 – Digital innovation, Unit 4 – Digital impacts

Digital Solutions enables students to learn about algorithms, computer languages and user interfaces through generating digital solutions to problems. Students will learn about:

- creating with code
- application and data solutions
- digital innovation
- digital impacts.

Aligns with the following syllabus objectives:

1. Recognise and describe elements, components, principles and processes
2. Symbolise and explain information, ideas and interrelationships
3. Analyse problems and information
4. Determine solution requirements and criteria
5. Synthesise information and ideas to determine possible digital solutions
6. Generate components of the digital solution

7. Evaluate impacts, components and solutions against criteria to make refinements and justified recommendations
8. Make decisions about and use mode-appropriate features, language and conventions for particular purposes and contexts

Digital Solutions helps develop the following 21st century skills:

- critical thinking
- creative thinking
- communication
- collaboration and team work
- personal and social skills
- information and communication technology skills

Engineering Unit 2 – Emerging Technologies

Engineering includes the study of mechanics, materials science and control technologies through real-world engineering contexts where students engage in problem-based learning. Students will learn about:

- engineering fundamentals and society
- emerging technologies
- statics of structures and environmental considerations
- machines and mechanisms.

Aligns with these syllabus objectives:

1. Recognise and describe engineering problems, knowledge, concepts and principles
2. Symbolise and explain ideas and solutions
3. Analyse problems and information
4. Determine solution success criteria for engineering problems
5. Synthesise information and ideas to predict possible solutions
6. Generate prototype solutions to provide data to assess the accuracy of predictions
7. Evaluate and refine ideas and solutions to make justified recommendations
8. Make decisions about and use mode-appropriate features, language and conventions for particular purposes and contexts.

Engineering helps develop the following 21st century skills:

- critical thinking
- creative thinking
- communication
- collaboration and team work
- personal and social skills
- information and communication technology skills