

ENGINEERING

HOW WILL I BENEFIT FROM STUDYING ENGINEERING?

Engineering is a course of study which contextualises the Australian Curriculum (Technologies, Mathematics, Science) and prepares students for Senior Engineering. It challenges you to explore open-ended problems and actively construct your learning by undertaking purposeful engineering activities and applying learned technical knowledge, principles, processes, and skills.

The problem-solving process in Engineering aligns with a problem-based framework, requiring engagement with the phases of exploring, developing, generating, evaluating, and refining to mirror real-world scenarios. Engineering allows for the development of critical and creative thinking, communication, collaboration, and teamwork, personal and social skills, and information and communication skills.

THE MAIN AREAS OF FOCUS THROUGH THE COURSE OF STUDY ARE:

- Engineering Materials Science
- Engineering Mathematics (Mechanics)
- Control Systems (electronics, flow charts, logic)
- Engineering Communication – CAD software (Fusion 360, ArchiCAD)
- Workshop tools & equipment including safe and responsible use
- 21st Century tooling – 3D printers, Laser cutters, CNC routers
- Project-Folio compilation – Presentation & reporting techniques for problem-based learning challenges

WHAT ARE THE TOPICS IN YEAR 9?

- 3D parametric software – Fusion 360: Modelling, simulation, working drawings
- Architectural Communication – ArchiCAD
- Additive Manufacture – 3D printing
- Laser cutting and etching
- Hydraulics/Pneumatics
- Drones
- Catapults

WHAT ARE THE TOPICS IN YEAR 10?

Year 10 expands upon the learning experiences from Year 8 onwards with a slight change in course structure with the introduction of more theory (mathematics and materials science) with an examination. This occurs prior to senior subject selection to highlight to students the extent of theory in Year 11 and 12:

- 3D Parametric Software – Fusion 360: Modelling, Simulation, Working Drawings
- Architectural Communication – Archicad
- Additive Manufacture – 3D Printing
- Laser Cutting & Etching
- Foundational Engineering Mathematics & Materials Science Unit (One Semester)

WHAT IS THE ASSESSMENT?

The problem-based projects in Year 9 and 10 typically span a term and require submission towards the end, of a Project Folio documenting evidence of the learning that has taken place.

For Engineering Communication units (Fusion/ArchiCAD) this will take the form of:

- Engineering Drawings
- Floor Plans
- Stress Analysis/Simulation

For PBL Challenges (drones, catapults, hydraulic arms), this will take the form of a Project-Folio which touches on all phases of the Engineering Problem Solving process (Identified Problem, Explore, Develop, Generate, Evaluate & Refine and Recommended Solution). For the Additive Manufacture unit (3D Printers), this will include:

- A practical component;
- Safety test (onguard); and
- Technical report/project-folio

Year 10: Theoretical Examination on Foundational Engineering Concepts – Materials Science and Engineering Mathematics, in preparation for Unit 1 in Year 11