

## 2026 Queensland Quantum Challenge - Curriculum Alignment to Australian Curriculum V9 – Engineering (for Year 11)

The Engineering Rationale is bolded where there is alignment to the 2026 Queensland Quantum Challenge. The Unit/Syllabus Objectives included provide connections to domains where applications of quantum and advanced technologies are being harnessed to solve problems.

### Engineering Rationale

**The problem-solving process in Engineering involves the practical application of science, technology, engineering and mathematics (STEM) knowledge to develop sustainable products, processes and services. Engineers use their technical and social knowledge to solve problems in ways that meet the needs of today's individuals, communities, businesses and environments, without compromising the potential needs of future generations. Students who study Engineering develop technical knowledge and problem-solving skills that enable them to respond to and manage ongoing technological and societal change.**

**Engineering includes the study of mechanics, materials science and control technologies through real-world engineering contexts where students engage in problem-based learning. Students learn to explore complex, open-ended problems and develop engineered solutions.** They recognise and describe engineering problems, determine success criteria, develop and communicate ideas and propose, generate, evaluate and refine real-world-related solutions. **Students justify their decision-making and acknowledge the societal, economic and environmental sustainability of their engineered solutions. The problem-based learning framework in Engineering encourages students to become self-directed learners and develop beneficial collaboration and management skills.**

Engineering provides students with an opportunity to experience, first-hand and in a practical way, the exciting and dynamic work of real-world engineers. **Students learn transferrable 21st century skills that support their life aspirations, including critical thinking, creative thinking, communication, collaboration and teamwork, personal and social skills, and information & communication technologies (ICT) skills.** The study of Engineering inspires students to become adaptable and resilient. They appreciate the engineer's ability to confidently and proficiently generate solutions that improve the quality of people's lives in an increasingly complex and dynamic technological world.

## Engineering Syllabus objectives

The following Engineering syllabus objectives align to the 2026 Queensland Quantum Challenge.

### **3. Analyse problems and information.**

**When students analyse problems and information, they research and investigate to explain and interpret, for the purpose of finding meaning or relationships. They determine the reasonableness of information and ascertain patterns, similarities and differences in order to identify elements, components and features, and their relationship to the structure of problems**

### **5. Synthesise information and ideas to propose possible solutions.**

**When students synthesise information and ideas to propose possible solutions, they combine and integrate information and ideas, and resolve uncertainties using knowledge of technology, mechanics, materials science and control technologies, and knowledge gained through research, investigation and testing to create new understanding.**

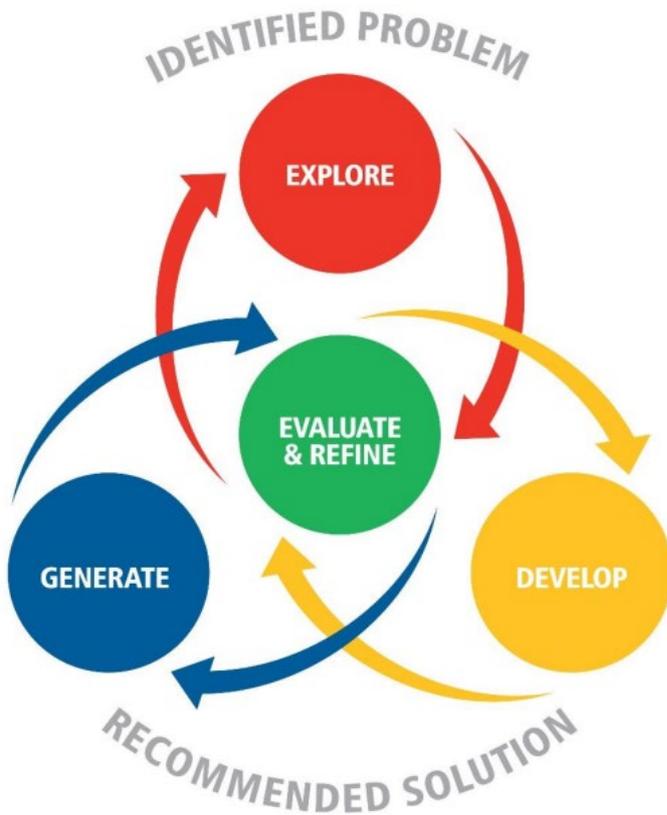
### **7. Evaluate and refine ideas and solutions to make justified recommendations.**

**When students evaluate, they appraise ideas and solutions by weighing up or assessing strengths, implications and limitations against success criteria. When students refine solutions, they modify to make improvements relative to success criteria. They use data, provided by testing, to evaluate and refine solutions. When students make justified recommendations, they put forward a point of view or suggestion with supporting evidence to make modifications.**

## Engineering Procedural Knowledge

The 2026 Queensland Quantum Challenge is structured to provide students with the opportunity to apply “The problem-solving process in Engineering” (Figure 1 below). This process is iterative and includes the four phases of Explore, Develop, Generate, and Evaluate and refine. Evaluate and refine is a critical phase as it involves making decisions about where and how the process will proceed relative to the other phases. The decisions students make about moving within and between the various phases reflect the iterative nature of the process.

Figure 1: Problem-solving process in Digital Solutions



Senior Engineering	
Unit / Syllabus Objectives	Subject Matter
Unit 2: Emerging Technologies	<ul style="list-style-type: none"> <li>• Comprehend the ethical and social implications of emerging technologies, including                             <ul style="list-style-type: none"> <li>○ intelligent robotics</li> <li>○ intelligent computers and sensors.</li> </ul> </li> </ul>