

# Master of Engineering (Industrial Automation)

## Mapping of Program Learning Outcomes with Graduate Attributes and Engineers Australia Stage-1 Competencies for Professional Engineers

EA stage 1 competencies - Professional Engineer	Program Learning Outcomes	MEng Graduate Attributes
<b>KNOWLEDGE AND SKILL BASE</b>		
PE 1.1 Comprehensive, theory-based understanding of the underpinning natural and physical sciences and the engineering fundamentals applicable to the engineering discipline.	1. Demonstrate sound fundamental understanding of the scientific and engineering principles and apply underpinning natural, physical, and engineering sciences, mathematics, statistics, computer, and information sciences to solve problems in Industrial Automation engineering.	GA1.1 Demonstrate competence in mathematics, natural sciences, and engineering fundamentals.
PE 1.2 Conceptual understanding of the mathematics, numerical analysis, statistics, and computer and information sciences that underpin the engineering discipline.		GA 1.4 Use numerical analysis, statistics, computer, and information technology to develop solutions.
PE 1.3 In-depth understanding of specialist bodies of knowledge within the engineering discipline.	2. Apply in-depth as well as broad understanding of the relevant specialist body of knowledge within the Industrial Automation engineering discipline including: programming logic controllers; control systems and instrumentation; safety systems; machine learning; Industrial communication, SCADA, and systematic project management.	GA 1.2 Possess specialised engineering knowledge appropriate to the discipline.

PE 1.4 Discernment of knowledge development within the engineering discipline.	3. Reflect critically on a broad body of engineering knowledge to plan and execute an Industrial Automation engineering research-based project, with awareness to knowledge development and research direction within the engineering discipline.	GA 4.2 Independent self-directed learner with the ability to evaluate and synthesise the research and professional literature in their specialised area of engineering
PE 1.5 Knowledge of engineering design practice and contextual factors impacting the engineering discipline.	4. Draw on the knowledge of engineering design practice and understand the scope, principles, norms, accountabilities and bounds of sustainable engineering practice in the Industrial Automation engineering discipline.	GA 4.3 Recognise the impact of engineering within the broader industry and community interest.
PE 1.6 Understanding of the scope, principles, norms, accountabilities and bounds of contemporary engineering practice in the specific discipline.		GA 2.2 Apply reflective practice to social, economic, global, cultural, and environmental factors to devise sustainable engineering solutions.
<b>ENGINEERING APPLICATION ABILITY</b>		
PE 2.1 Application of established engineering methods to complex engineering problem solving.	5. Apply systematic approaches, design processes and established engineering methods, tools, techniques, and resources, underpinned by hazard and risk framework considerations to conduct and manage Industrial Automation engineering projects.	GA 2.1 Effective problem solvers, who apply creativity and critical thinking to problem solving.
PE 2.2 Fluent application of engineering techniques, tools, and resources.		GA 1.3 Use discipline-specific techniques, resources, and engineering tools.
PE 2.3 Application of systematic synthesis and design processes.		GA 3.3 Use systemic engineering synthesis and design processes.
PE 2.4 Application of systematic approaches to the conduct and management of engineering projects.		GA 3.1 Identify, define, devise, and execute a plan to conduct and manage engineering projects.

PROFESSIONAL AND PERSONAL ATTRIBUTES		
PE 3.2 Effective oral and written communication in professional and lay domains.	6. Communicate effectively technical ideas, design concepts or research results to a diverse audience.	GA 5.1 Identify and credibly communicate engineering and general knowledge.
PE 3.3 Creative, innovative, and pro-active demeanour.	7. Recognise and pro-actively engage in ongoing professional development and lifelong learning, as well as develop creative and innovative solutions to engineering problems.	GA 3.2 Proactive, creative, and innovative in defining engineering problems within a wider global context.
PE 3.4 Professional use and management of information.	8. Demonstrate professional use and management of information.	GA 5.2 Demonstrate professional use and management of information
PE 3.5 Orderly management of self and professional conduct.	9. Apply discipline and professional knowledge and skills to demonstrate autonomy, adaptability, and responsibility as a professional engineer.	GA 4.1 Resilient, flexible, and self-aware individuals who can develop a strategy to identify and address gaps in knowledge and professional practice.
PE 3.6 Effective team membership and team leadership	10. Collaboratively work as a member of a cross disciplinary team in a manner consistent with ethical and professional standards.	GA 5.3 Develop effective team membership and leadership and work collaboratively in a positive manner to achieve common goals.
PE 3.1 Ethical conduct and professional accountability.		GA 4.4 Act ethically and demonstrate professionalism, individual accountability, and social responsibility.