



SAMPLE ASSESSMENT OUTLINE

ENGINEERING STUDIES (MECHATRONICS)

ATAR YEAR 12

Acknowledgement of Country

Kaya. The School Curriculum and Standards Authority (the Authority) acknowledges that our offices are on Whadjuk Noongar boodjar and that we deliver our services on the country of many traditional custodians and language groups throughout Western Australia. The Authority acknowledges the traditional custodians throughout Western Australia and their continuing connection to land, waters and community. We offer our respect to Elders past and present.

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Sample assessment outline

Engineering Studies – ATAR Year 12 (Mechatronics)

Unit 3 and Unit 4

Assessment type	Assessment type weighting	Assessment task weighting	When	Assessment task
Design	30%	5%	Semester 1 Weeks 1–3	Task 1A: Problem statement and design brief <ul style="list-style-type: none"> develop a comprehensive design brief in response to a problem, need or opportunity (student and/or teacher-directed) conduct research to identify and assess existing solutions or similar products research and critique materials and components relevant to the design brief consider different ways to supply energy for efficient and effective functioning of the design
		5%	Semester 1 Weeks 4–5	Task 1B: Concepts <ul style="list-style-type: none"> produce annotated pictorial sketches and/or drawings of design ideas produce annotated third-angle orthographic sketches of design ideas compare and analyse alternative designs and justify the choice of options to be used as the solution
		5%	Semester 2 Week 14	Task 1C: Project evaluation <ul style="list-style-type: none"> evaluate the resulting prototype or working model meet the requirements of the design safety, function, fit and finish modifications and changes to the design during production refinements and changes for future development
		5%	Semester 1 Week 5	Task 2: Test – Core theory: Orthographic drawings and fundamental engineering calculations (Unit 3 [50%] and Unit 4 [50%]) Multi-part questions requiring short answers and calculations to solve specific scenarios in any of the following syllabus content: <ul style="list-style-type: none"> Unit 3 Core content: Engineering design process <ul style="list-style-type: none"> Devising Unit 3 Core content: Fundamental engineering calculations <ul style="list-style-type: none"> dimensional, perimeter, surface area, volume Unit 3 Core content: Effects on society, the environment and industry

Assessment type	Assessment type weighting	Assessment task weighting	When	Assessment task
				<ul style="list-style-type: none"> ▪ Energy • Unit 4 Core content: Fundamental engineering calculations <ul style="list-style-type: none"> ▪ density, quantity estimates, efficiency, energy, work and power • Unit 4 Core content: Effects on society, the environment and industry <ul style="list-style-type: none"> ▪ Life cycle analysis of engineered products
		5%	Semester 1 Week 13	<p>Task 4: Test – Mechatronics: Electronics, interfacing and circuit theory (Unit 3 [50%] and Unit 4 [50%])</p> <p>Multi-part questions requiring short answers and calculations to solve specific scenarios in any of the following syllabus content:</p> <ul style="list-style-type: none"> • Unit 3 Mechatronics content: Electrical and electronics <ul style="list-style-type: none"> ▪ Components and equipment, laws and principles • Unit 4 Mechatronics content: Electrical and electronics <ul style="list-style-type: none"> ▪ Laws and principles • Unit 4 Mechatronics content: Systems and control <ul style="list-style-type: none"> ▪ Interfacing with microcontroller
		5%	Semester 2 Week 12	<p>Task 7 : Test – Mechatronics: Structural, mechanical and control (Unit 3 [50%] and Unit 4 [50%])</p> <p>Multi-part questions requiring short answers and calculations to solve specific scenarios in any of the following syllabus content:</p> <ul style="list-style-type: none"> • Unit 3 Core content: Materials <ul style="list-style-type: none"> ▪ Types and classification • Unit 4 Core content: Materials <ul style="list-style-type: none"> ▪ Properties • Unit 3 Core content: Mechanisms <ul style="list-style-type: none"> ▪ Simple machines and mechanisms • Unit 4 Core content: Fundamental engineering calculations <ul style="list-style-type: none"> ▪ Mechanisms • Unit 3 Mechatronics content: Systems and control <ul style="list-style-type: none"> ▪ Systems and control diagrams • Unit 4 Mechatronics Content: Systems and control <ul style="list-style-type: none"> ▪ Flow charts
Production	30%	10%	Semester 1 Weeks 2–11	<p>Task 3A: Project build (electrical)</p> <ul style="list-style-type: none"> • display project management skills for timely development and testing of project

Assessment type	Assessment type weighting	Assessment task weighting	When	Assessment task
				<ul style="list-style-type: none"> drill/wire printed circuit board, fit and solder components to construct a working electric circuit by selecting and using appropriate tools and machines and by following safe work practices test electrical aspects of the circuits for correct function
			Semester 1 Weeks 2–11	<p>Task 3B: Build documentation (electrical)</p> <ul style="list-style-type: none"> present schematics for electrical circuits including power supply, microcontroller and interfacing document electrical performance and parameters using checklists and test data production journal detailing timelines, tasks, issues, and solutions
		15%	Semester 2 Week 1–11	<p>Task 6A: Project build (structural, mechanical and control)</p> <ul style="list-style-type: none"> display project management skills for timely completion and testing of project manufacture structural parts by selecting and using appropriate tools and machines and by following safe work practices select/manufacture for correct mechanical operation fit manufactured parts and actuators develop, download, test and debug control strategy for appropriate sequence of operation test all aspects of the project for correct overall function
		5%	Semester 2 Week 1–11	<p>Task 6B: Build documentation (structural, mechanical and control)</p> <ul style="list-style-type: none"> present dimensioned pictorial or orthographic drawings of structural elements present operations and calculations for mechanical aspects of project present and explain operation of flow chart/code production journal detailing timelines, tasks, issues, and solutions parts lists costing of built model

Assessment type	Assessment type weighting	Assessment task weighting	When	Assessment task
Examination	40%	15%	Semester 1 Week 15	<p>Task 5: Semester 1 examination based on Unit 3 (50%) and Unit 4 (50%) content Three hours using the examination design brief from the ATAR Year 12 syllabus.</p> <p>Section one: core content (50% of the total examination)</p> <ul style="list-style-type: none"> • 5–8 short answer questions, without parts (10%) • 4–6 questions, each with parts (40%) <p>Section two: specialist engineering field – Mechatronics (50% of the total examination)</p> <ul style="list-style-type: none"> • 5–8 short answer questions, without parts (10%) • 4–6 questions, each with parts (40%)
		25%	Semester 2 Week 15	<p>Task 8: Semester 2 examination based on Unit 3 (50%) and Unit 4 (50%) content Three hours using the examination design brief from the ATAR Year 12 syllabus.</p> <p>Section one: core content (50% of the total examination)</p> <ul style="list-style-type: none"> • 5–8 short answer questions, without parts (10%) • 4–6 questions, each with parts (40%) <p>Section two: specialist engineering field – Mechatronics (50% of the total examination)</p> <ul style="list-style-type: none"> • 5–8 short answer questions, without parts (10%) • 4–6 questions, each with parts (40%)
Total	100%	100%		