



SAMPLE COURSE OUTLINE

AUTOMOTIVE ENGINEERING AND TECHNOLOGY

GENERAL 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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Disclaimer

Any resources such as texts, websites and so on that may be referred to in this document are provided as examples of resources that teachers can use to support their learning programs. Their inclusion does not imply that they are mandatory or that they are the only resources relevant to the course. Teachers must exercise their professional judgement as to the appropriateness of any they may wish to use.

Sample course outline

Automotive Engineering and Technology – General Year 12

Unit 3 and Unit 4

Semester 1

Week	Key teaching points
1–2	<p>Maintenance and repair</p> <ul style="list-style-type: none"> • apply safety data information and workshop work health and safety regulations to both individuals and small groups.
3–6	<p>Principles</p> <ul style="list-style-type: none"> • scientific principles <ul style="list-style-type: none"> ▪ chemical and mechanical energy ▪ energy conversion ▪ power ▪ motion ▪ friction and lubrication ▪ torque ▪ pressure ▪ their influence in selecting or modifying automotive technologies for improved performance <p>Systems</p> <ul style="list-style-type: none"> • relationships between the various systems that make up an automotive power plant or vehicle <ul style="list-style-type: none"> ▪ driveline ▪ wheels and tyres ▪ steering and suspension ▪ body and frame construction ▪ electrical systems ▪ cooling systems ▪ hydraulic braking systems
6–8	<p>Maintenance and repair</p> <ul style="list-style-type: none"> • demonstrate maintenance, testing and repair/replacement of major components in motor vehicle systems <ul style="list-style-type: none"> ▪ electrical system ▪ cooling system ▪ fuel and lubrication systems • perform adjustment of bearings and removal and repair of motor vehicle components, including wheels, body and mechanical parts • identify and use flow charts and problem-solving skills to diagnose faults in conjunction with the use of specialised tools and equipment • perform servicing, repair and maintenance requirements of various types of engines • identify materials and parts required for optimising the performance of various types of engines • apply safety data information and workshop work health and safety regulations to both individuals and small groups
9–10	<p>Design</p> <ul style="list-style-type: none"> • elements of design and techniques for generating and communicating design ideas • historical changes in design of automotive technologies, and their interaction with changing cultural values <p>Managing production</p> <ul style="list-style-type: none"> • prepare and use planning for, and management of, small-scale production of prototypes, incorporating design elements underpinned by research and performance testing <p>Materials</p> <ul style="list-style-type: none"> • historical perspectives of materials used in the automotive industry, and how they have evolved with changing values and needs of society • service repair and maintenance of automotive vehicles using computer-assisted techniques and fabrication skills

Week	Key teaching points
11–15	<p>Automotive industry</p> <p>Rules and regulations</p> <ul style="list-style-type: none"> • traffic rules associated with the safe use of vehicles • specific road traffic control for different types of vehicles <p>Social, economic and environmental implications and consequences</p> <ul style="list-style-type: none"> • relationships between changes in automotive technologies and impacts on communities and society • current legislation and environmental regulations associated with engine designs and manufacture of automotive technologies • local and global concerns for: <ul style="list-style-type: none"> ▪ advancements in automotive technologies ▪ demands for transport of materials and people ▪ environmental sustainability <p>Managing production</p> <ul style="list-style-type: none"> • prepare and use planning for, and management of, small-scale production of prototypes, incorporating design elements underpinned by research and performance testing
13	<p>Externally set task</p> <p>All students enrolled in the Automotive Engineering and Technology General Year 12 course will complete the externally set task developed by the School Curriculum and Standards Authority (the Authority).</p> <p>Schools are required to administer this task in Term 2 during a period of time prescribed by the Authority.</p>

Semester 2

Week	Key teaching points
1–3	<p>Revisit and reinforce safety in the workshop</p> <p>Rules and regulations</p> <ul style="list-style-type: none"> state and federal authorities and laws relating to servicing, repair and modification of automotive systems <p>Social, economic and environmental implications and consequences</p> <ul style="list-style-type: none"> future directions of the automotive industry and the implications for society alternative materials and power sources used in automotive technology new and emerging fuel sources, innovative designs and manufacturing processes that are sustainable on a global scale <p>Systems</p> <ul style="list-style-type: none"> identification of technological improvements in systems, subsystems and components in response to performance testing identification of advanced systems, subsystems and components that influence development and performance of automotive vehicles
4–8	<p>Maintenance and repair</p> <ul style="list-style-type: none"> flowcharts and problem-solving skills to diagnose faults in conjunction with the use of specialised tools and equipment service, repair and maintenance requirements of more advanced engines, and the skills, knowledge, materials, parts and equipment needed to optimise performance work health and safety requirements for different processes and collaborative practices involved in workshop activities. <p>Systems</p> <ul style="list-style-type: none"> identification of technological improvements in systems, subsystems and components in response to performance testing identification of advanced systems, subsystems and components that influence development and performance of automotive vehicles
6–9	<p>Principles</p> <ul style="list-style-type: none"> current and emerging scientific principles and developments in automotive operations and technologies diagrammatic representations of principles that underpin current automotive components and operations, including: power train, steering systems and braking systems mathematical formula to explain current operations of automotive components, and assist in diagnosis of system performance; Torque [τ], Rotational Power [Pr] and Pressure [P] or Stress [σ]
10–15	<p>Design, materials and production management</p> <p>Materials</p> <ul style="list-style-type: none"> scenarios for the predicted uses of new and emerging materials selected for their properties and behaviours in the construction and use of automotive technologies <p>Design</p> <ul style="list-style-type: none"> apply elements of design and techniques for generating and communicating design ideas current automotive design rules and regulations that meet the needs of new and emerging automotive technologies <p>Managing production</p> <ul style="list-style-type: none"> apply planning for, and management of, small-scale production of prototypes, incorporating design elements underpinned by research and performance testing