



SAMPLE COURSE OUTLINE

AUTOMOTIVE ENGINEERING AND TECHNOLOGY

GENERAL YEAR 11

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 course outline

Automotive Engineering and Technology – General Year 11

Unit 1 and Unit 2

Semester 1

Week	Key teaching points
1–2	<p>Introduction to Unit 1, workshop and tasks</p> <p>Rules and regulations</p> <ul style="list-style-type: none"> • storage, use and care of tools and machinery • work health and safety procedures, working safely in the workshop and safe use of prescribed machinery and technologies • apply the rules associated with the use of vehicles when servicing/maintenance
3–5	<p>Systems</p> <ul style="list-style-type: none"> • 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 <p>Maintenance and repair</p> <ul style="list-style-type: none"> • apply testing techniques involved with daily/weekly checks and monitoring of the operation of single or multi-cylinder engines • identify and use tools, equipment, parts and materials used in automotive industry
6–8	<p>Principles</p> <ul style="list-style-type: none"> • the scientific principles in relation to automotive functioning <ul style="list-style-type: none"> ▪ Otto cycle ▪ reciprocating and rotary motion ▪ hydraulics ▪ forces ▪ mechanical advantage ▪ alignment

Week	Key teaching points
9–10	<p>Social, economic and environmental implications</p> <ul style="list-style-type: none"> • different forms of transportation used in society • categories of occupations and careers associated with the automotive and affiliated industries • the impact of materials processing and the effects on the environment and society <p>Design</p> <ul style="list-style-type: none"> • apply design skills, including: <ul style="list-style-type: none"> ▪ brainstorming ▪ investigating and generating ideas ▪ fundamentals of communicating design by graphics ▪ graphical representation <p>Materials</p> <ul style="list-style-type: none"> • different types of component materials and their application to various design concepts • identification and use of fasteners and methods of fitting and fixing materials and components • understanding of fundamental methods of forming and machining materials for specific needs • aesthetic and environmental properties of materials in prescribed context
11–15	<p>Principles</p> <ul style="list-style-type: none"> • the scientific principles in relation to automotive functioning <ul style="list-style-type: none"> ▪ Otto cycle ▪ reciprocating and rotary motion ▪ hydraulics ▪ forces ▪ mechanical advantage ▪ alignment <p>Maintenance and repair</p> <ul style="list-style-type: none"> • apply testing techniques involved with daily/weekly checks and monitoring of the operation of single or multi-cylinder engines • identify and use tools, equipment, parts and materials used in automotive industry <p>Managing production</p> <ul style="list-style-type: none"> • prepare and execute simple production plans, time planning, identification of resource needs, and evaluation of manufacturing processes
15–16	<p>Maintenance and repair</p> <ul style="list-style-type: none"> • apply testing techniques involved with daily/weekly checks and monitoring of the operation of single or multi-cylinder engines • identify and use tools equipment, parts and materials used in automotive industry

Semester 2

Week	Key teaching points
1–2	Introduction to Unit 2, workshop and tasks Rules and regulations
3–5	Systems <ul style="list-style-type: none"> • operating functions of 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
6–7	Rules and regulations <ul style="list-style-type: none"> • traffic rules associated with the safe use of vehicles • road traffic control and different types of vehicles • authorities responsible for rules and regulations, and legal implications of vehicle design and road use
7–8	Social, economic and environmental implications <ul style="list-style-type: none"> • categories of occupations and careers associated with the automotive and affiliated industries • automotive design, size and capacity • cost of operating different forms of vehicles • environmental issues and considerations of materials used and automotive emissions
7–9	Design <ul style="list-style-type: none"> • apply design skills, including: <ul style="list-style-type: none"> ▪ brainstorming ▪ investigating and generating ideas ▪ fundamentals of communicating design by graphics ▪ graphical representation • consider Australian Design Rules in relation to vehicle design
9–12	Materials <ul style="list-style-type: none"> • physical and mechanical properties of materials used in automotive technologies • identification and use of methods of welding materials • consider workshop-based, computer-assisted fabrication techniques Managing production <ul style="list-style-type: none"> • prepare and use planning for, and management of, manufacturing processes • compare strategies for automotive design and component design
10–12	Principles <ul style="list-style-type: none"> • the scientific principles in their relation to automotive functioning <ul style="list-style-type: none"> ▪ Otto cycle ▪ reciprocating and rotary motion ▪ hydraulics ▪ forces ▪ mechanical advantage ▪ alignment ▪ transmission of electrical and mechanical power ▪ conversion of heat energy into mechanical energy

Week	Key teaching points
11–16	<p>Systems</p> <ul style="list-style-type: none">• operating functions of 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 <p>Maintenance and repair</p> <ul style="list-style-type: none">• carry out tune-ups, oil changes and service schedules to maintain optimal performance• identify and use tools, equipment, parts and materials used in repair and correction of mechanical faults• maintain work health and safety procedures, working safely in the workshop and safe use of prescribed machinery and technologies• apply rules associated with the use of vehicles when servicing/maintenance