



## SAMPLE COURSE OUTLINE

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**AUTOMOTIVE ENGINEERING AND TECHNOLOGY**  
**GENERAL YEAR 12**

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## Sample course outline

### Automotive Engineering and Technology – General Year 12

#### Unit 3 and Unit 4

#### Semester 1

| Week | Key teaching points  |
|------|--|
| 1–3  | <p>Introduction to course, workshop and tasks</p> <p>Workshop safety</p> <ul style="list-style-type: none"> <li>apply safety data information and workshop occupational safety and health (OSH) regulations to both individuals and small groups</li> </ul> <p><b>Task 1:</b> Automotive mechanics – safety</p> <ul style="list-style-type: none"> <li>complete safety certificate</li> </ul>  |
| 4–6  | <p><b>Principles</b> – scientific principles</p> <ul style="list-style-type: none"> <li>scientific principles – chemical and mechanical energy, energy conversion, power, motion, friction and lubrication, torque, pressure, and their influence in selecting or modifying automotive technologies for improved performance</li> </ul> <p><b>Task 2:</b> Report on different fuels and lubricants</p>   |
| 6–8  | <p><b>Maintenance and repair</b></p> <ul style="list-style-type: none"> <li>demonstrate maintenance, testing and repair/replacement of major components in motor vehicle systems <ul style="list-style-type: none"> <li>electrical system</li> <li>cooling system</li> <li>fuel and lubrication systems</li> </ul> </li> <li>perform adjustment of bearings and removal and repair of motor vehicle components, including wheels, body and mechanical parts</li> <li>identify and use flow charts and problem-solving skills to diagnose faults in conjunction with the use of specialised tools and equipment</li> <li>perform servicing, repair and maintenance requirements of various types of engines</li> <li>identify materials and parts required for optimising the performance of various types of engines</li> <li>apply safety data information and workshop occupational safety and health (OSH) regulations to both individuals and small groups</li> </ul> <p><b>Task 3:</b> Complete under-vehicle activities</p> <p>Occupational Health and Safety. Chassis, under-vehicle and suspension component inspection. Lubrication of parts. Removal and replacement of shock absorber and strut</p> |
| 9–10 | <p><b>Design</b></p> <ul style="list-style-type: none"> <li>elements of design and techniques for generating and communicating design ideas</li> <li>historical changes in design of automotive technologies, and their interaction with changing cultural values</li> </ul> <p><b>Managing production</b></p> <ul style="list-style-type: none"> <li>prepare and use planning for, and management of, small-scale production of prototypes, incorporating design elements underpinned by research and performance testing</li> </ul> <p><b>Materials</b></p> <ul style="list-style-type: none"> <li>historical perspectives of materials used in the automotive industry, and how they have evolved with changing values and needs of society</li> <li>service repair and maintenance of automotive vehicles using computer-assisted techniques and fabrication skills</li> </ul> <p><b>Task 4 Part A:</b> Design brief – design a tool or device to be used during automotive workshop activities</p> <p>Investigate tools, materials and production methods</p> <p>Develop a prototype tool or device</p>   |

| Week  | Key teaching points   |
|-------|---|
| 11–15 | <p><b>Managing production</b></p> <ul style="list-style-type: none"> <li>prepare and use planning for, and management of, small-scale production of prototypes, incorporating design elements underpinned by research and performance testing</li> </ul> <p><b>Task 4 Part B:</b> Produce a tool or device to be used during automotive workshop activities</p> |
| 13    | <p><b>Externally set task</b></p> <p>All students enrolled in the Automotive Engineering and Technology General Year 12 course will complete the externally set task developed by the Authority.</p> <p>Schools are required to administer this task in Term 2 at a time prescribed by the Authority.</p>   |

## Semester 2

| Week | Key teaching points   |
|------|---|
| 1–3  | <p>Revisit and re-enforce safety in the workshop</p> <p><b>Rules and regulations</b></p> <ul style="list-style-type: none"> <li>State and federal authorities and laws relating to servicing, repair and modification of automotive systems</li> </ul> <p><b>Social, economic and environmental implications and consequences</b></p> <ul style="list-style-type: none"> <li>future directions of the automotive industry and the implications for society</li> <li>alternative materials and power sources used in automotive technology</li> <li>new and emerging fuel sources, innovative designs and manufacturing processes that are sustainable on a global scale</li> </ul> <p><b>Systems</b></p> <ul style="list-style-type: none"> <li>identification of technological improvements in systems, sub-systems and components in response to performance testing</li> <li>identification of advanced systems, sub-systems and components that influence development and performance of automotive vehicles</li> </ul> <p><b>Task 4 Part C:</b> Test and evaluate finished workshop tool or device</p> <p><b>Task 5:</b> Report on the automotive industry, regulations and development of vehicle performance</p> |
| 4–6  | <p><b>Maintenance and repair</b></p> <ul style="list-style-type: none"> <li>flow charts and problem-solving skills to diagnose faults in conjunction with the use of specialised tools and equipment</li> <li>service, repair and maintenance requirements of more advanced engines, and the skills, knowledge, materials, parts and equipment needed to optimise performance</li> <li>occupational safety and health requirements for different processes and collaborative practices involved in workshop activities</li> </ul> <p><b>Systems</b></p> <ul style="list-style-type: none"> <li>identification of technological improvements in systems, subsystems and components in response to performance testing</li> <li>identification of advanced systems, subsystems and components that influence development and performance of automotive vehicles</li> </ul> <p><b>Task 6:</b> Vehicle maintenance – current processes and latest techniques</p> <p>Investigation and demonstration of current processes and latest workshop techniques</p>   |

| Week  | Key teaching points  |
|-------|--|
| 6–8   | <p><b>Principles</b></p> <ul style="list-style-type: none"> <li>• current and emerging scientific principles and developments in automotive operations and technologies</li> <li>• diagrammatic representations of principles that underpin current automotive components and operations, including power train, steering systems and braking systems</li> <li>• mathematical formula to explain current operations of automotive components, and assist in diagnosis of system performance; Torque [<math>\tau</math>], Rotational Power [Pr] and Pressure [P] or Stress[<math>\sigma</math>]</li> </ul> <p><b>Task 7:</b> Investigations to understand torque, rotational power and pressure/stress in the power train, steering systems and braking systems</p> |
| 9–11  | <p><b>Maintenance and repair</b></p> <p><b>Task 8 Part A and Part B:</b> Vehicle trouble-shooting techniques</p>   |
| 12–15 | <p><b>Design, materials and production management</b></p> <p><b>Task 9:</b> Design a model and apply different methods of fitting and joining automotive materials together</p>  |