**Sample Course Outline**

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 | Introduction to course, workshop and tasks  **Workshop safety**   * apply safety data information and workshop occupational safety and health (OSH) regulations to both individuals and small groups   **Task 1: Automotive mechanics – s**afety   * complete safety certificate |
| 4–6 | **Principles** – scientific principles   * 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   **Task 2:** Report on different fuels and lubricants |
| 6–8 | **Maintenance and repair**   * demonstrate maintenance, testing and repair/replacement of major components in motor vehicle systems * 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 occupational safety and health (OSH) regulations to both individuals and small groups   **Task 3:** Complete under-vehicle activities  Occupational Health and Safety. Chassis, under-vehicle and suspension component inspection.  Lubrication of parts. Removal and replacement of shock absorber and strut |
| 9–10 | **Design**   * 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   **Managing production**   * prepare and use planning for, and management of, small-scale production of prototypes, incorporating design elements underpinned by research and performance testing   **Materials**   * 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   **Task 4 Part A:** Design brief – design a tool or device to be used during automotive workshop activities  Investigate tools, materials and production methods  Develop a prototype tool or device |
| 11–15 | **Managing production**   * prepare and use planning for, and management of, small-scale production of prototypes, incorporating design elements underpinned by research and performance testing   **Task 4 Part B**: Produce a tool or device to be used during automotive workshop activities |
| 13 | **Externally set task**  All students enrolled in the Automotive Engineering and Technology General Year 12 course will complete the externally set task developed by the Authority.  Schools are required to administer this task in Term 2 at a time prescribed by the Authority. |

Semester 2

| **Week** | **Key teaching points** |
| --- | --- |
| 1–3 | Revisit and re-enforce safety in the workshop  **Rules and regulations**   * State and federal authorities and laws relating to servicing, repair and modification of automotive systems   **Social, economic and environmental implications and consequences**   * 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   **Systems**   * identification of technological improvements in systems, sub-systems and components in response to performance testing * identification of advanced systems, sub-systems and components that influence development and performance of automotive vehicles   **Task 4 Part C: Test and evaluate finished workshop tool or device**  **Task 5: Report on the automotive industry, regulations and development of vehicle performance** |
| 4–6 | **Maintenance and repair**   * flow charts 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 * occupational safety and health requirements for different processes and collaborative practices involved in workshop activities   **Systems**   * 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   **Task 6:** Vehicle maintenance – current processes and latest techniques  Investigation and demonstration of current processes and latest workshop techniques |
| 6–8 | **Principles**   * 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]   **Task 7:** **Investigations to understand torque, rotational power and pressure/stress in the** power train, steering systems and braking systems |
| 9–11 | **Maintenance and repair**  **Task 8 Part A and Part B:** Vehicle trouble-shooting techniques |
| 12–15 | **Design, materials and production management**  **Task 9:** Design a model and apply different methods of fitting and joining automotive materials together |