**Sample Course Outline**

Automotive Engineering and Technology

General Year 11

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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 | Introduction to Unit 1, workshop and tasks  **Rules and regulations**   * storage, use and care of tools and machinery * occupational safety and health (OSH) 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   **Task 1: Safety in the workshop** |
| 3–5 | **Systems**   * the various systems that make up an automotive power plant or vehicle   + driveline   + wheels and tyres   + steering and suspension   + body and frame construction   + electrical systems   + cooling systems   + hydraulic braking systems   **Maintenance and repair**   * 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   **Task 2 Part A: Motor vehicle safety inspection**  Using the workshop cars and equipment, and in consultation with your teacher, complete a multiple-point safety vehicle inspection  **Task 2 Part B: Motor vehicle component maintenance inspection**  Using the workshop cars and equipment, and in consultation with your teacher, complete a component maintenance inspection |
| 6–8 | **Principles**   * the scientific principles in relation to automotive functioning   + Otto cycle   + reciprocating and rotary motion   + hydraulics   + forces   + mechanical advantage   + alignment   **Task 3 Part A: Scientific principles of two and four stroke engine cycles** |
| 9–10 | **Social, economic and environmental implications**   * 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   **Design**   * apply design skills, including:   + brainstorming   + investigating and generating ideas   + fundamentals of communicating design by graphics   + graphical representation   **Task 3 Part B: Different vehicular types and styles**  List and categorise the different forms and designs of transportation used in society  **Materials**   * 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   **Task 4: Automotive materials identification** |
| 11–15 | **Principles**   * the scientific principles in relation to automotive functioning   + Otto cycle   + reciprocating and rotary motion   + hydraulics   + forces   + mechanical advantage   + alignment   **Maintenance and repair**   * 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   **Managing production**   * prepare and execute simple production plans, time planning, identification of resource needs, and evaluation of manufacturing processes   **Task 5: Engine build and components**  **Task 6: Complete engine dismantle and rebuild** |
| 15–16 | **Maintenance and repair**   * 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   **Task 7: Engine test and tune** |

Semester 2

| **Week** | **Key teaching points** |
| --- | --- |
| 1–2 | Introduction to Unit 2, workshop and tasks  **Rules and regulations**  **Task 8: Revisit and reinforce safety in the workshop** |
| 3–5 | **Systems**   * operating functions of the various systems that make up an automotive power plant or vehicle   + driveline   + wheels and tyres   + steering and suspension   + body and frame construction   + electrical systems   + cooling systems   + hydraulic braking systems   **Task 9: Report on the operation of an automotive mechanical system** |
| 6–7 | **Rules and regulations**   * 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   **Task 10: Report on roadworthiness of a standard family vehicle** |
| 7–8 | **Social, economic and environmental implications**   * 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   **Task 11: Report on costs associated with operating standard passenger vehicles** |
| 7–9 | **Design**   * apply design skills, including:   + brainstorming   + investigating and generating ideas   + fundamentals of communicating design by graphics   + graphical representation * consider Australian Design Rules in relation to vehicle design   **Task 12 Part A: Design a tool or device to be used during automotive workshop activities** |
| 9–12 | **Materials**   * 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**   * prepare and use planning for, and management of, manufacturing processes * compare strategies for automotive design and component design   **Task 12 Part B: Build the proposed tool or device to be used during automotive workshop activities** |
| 10–12 | **Principles**   * the scientific principles in their relation to automotive functioning   + Otto cycle   + reciprocating and rotary motion   + hydraulics   + forces   + mechanical advantage   + alignment   + transmission of electrical and mechanical power   + conversion of heat energy into mechanical energy   **Task 13: Car maintenance techniques and investigations to understand processes** |
| 11–16 | **Systems**   * operating functions of the various systems that make up an automotive power plant or vehicle   + driveline   + wheels and tyres   + steering and suspension   + body and frame construction   + electrical systems   + cooling systems   + hydraulic braking systems   **Maintenance and repair**   * 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 occupational safety and health (OSH) 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   **Task 14**: **Car maintenance techniques**  **Task 15: Basic car troubleshooting techniques** |