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 * 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 | 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 |
| 6–8 | Principles   * the scientific principles in relation to automotive functioning   + Otto cycle   + reciprocating and rotary motion   + hydraulics   + forces   + mechanical advantage   + alignment |
| 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   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 |
| 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 |
| 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 |

Semester 2

|  |  |
| --- | --- |
| Week | Key teaching points |
| 1–2 | Introduction to Unit 2, workshop and tasks  Rules and regulations |
| 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 |
| 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 |
| 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 |
| 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 |
| 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 |
| 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 |
| 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 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 |