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 tasksRules 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 tasksRules 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
 |