**Sample Course Outline**

Engineering Studies

ATAR Year 11

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# Sample course outline

# Engineering Studies – ATAR Year 11

## Unit 1 and Unit 2

## Semester 1

| **Week** | **Key teaching points** |
| --- | --- |
| **Term 1**1–2 | Overview of unit and assessment requirements Introduction to design process**Task 1:** **Design project one** * development of a design folio
* design brief , and investigation

**Engineering design process – Investigating** * develop a design brief
* use research skills to identify existing solutions/products
* describe and analyse existing solutions/products
 |
| 3–5 | Learning of specialist theory and specific understandings from either specialty field; Mechanical or Mechatronics**Task 2: Investigate materials and components** * research materials and components suitable for the development of a solution
* research forms of energy
* determine form of energy suitable for the project

**Investigating****Core Materials** –classify types of materials**Engineering in Society** –definitions, and forms of energy**Specialty fields: Mechanical** materials, **Mechatronics** components |
| 6–7 | **Task 3: Developing a solution for Project one*** through annotated pictorial drawings of ideas to an final drawn proposal
* annotated orthographic concept drawings either CAD or hand drawn
* calculations to estimate design function

**Devising** * produce annotated pictorial drawings of design ideas
* analyse the chosen option to be used as the solution

**Fundamental Engineering calculations****Quantity estimates** |
| 8–10  | **Task 4: Pre-production*** working drawings – detailed orthogonal drawings
* lists of materials, parts and components
* develop production plan on a timeline

**Task 5: Pre-production skills**Develop production skills; apply safety and practice task/s to develop practical hand and machine skills. Modelling or prototype **Producing** * present specifications for the selected solution
* dimensioned pictorial and orthographic drawings
* materials selected, parts lists, costing of prototype or working model
* develop and use a timeline to construct and test the solution
* construct solution by selecting and using appropriate tools and machines, following safe work practices
 |

| **Week** | **Key teaching points** |
| --- | --- |
| Term 21–5 | **Task 6:** **Manufacture of proposed Project one**Using prepared production plan, materials and available equipment; record progress in design folio. |
| 6 | **Task 7: Evaluation of completed Project one**Prepare written report on and photographs of completed product.**Evaluating** –evaluate the final solution * test the solution for correct function and document using checklists and test data
 |
| Examination weeks 7–8 | **Task 8:** **Semester 1 examination** –of approximately 2 hours, using a modified examination design brief from the Year 12 syllabus |

## Semester 2

| **Week** | **Key teaching points** |
| --- | --- |
| **Term 3**1–3 | Overview of unit and assessment requirements Re-introduction to design process, and development of a design folio**Task 9:** **Design Project two** design process* determine design brief
* investigate and develop ideas

**Engineering design process****Investigating** * develop a design brief
* describe and analyse existing solutions/products
* research and describe materials and components relevant to the design brief
* consider appropriate forms of energy supplies
 |
| 4–6 | Learning of specialist theory and specific understandings from either specialty field; Mechanical or Mechatronics**Task 10: Investigate materials and components** * research materials and components suitable for the development of a solution
* research efficiency of selected forms of energy
* research obsolescence

**Core Materials** –physical properties of materials* fitness for purpose
* identify and describe the required properties of a material for a specified application

**Energy** –efficiency**Engineering in Society** – obsolescence **Specialty fields: Mechanical** materials, **Mechatronics** components |
| 7–8 | **Task 11:** **Developing a solution for Project two*** through annotated pictorial drawings of ideas to an final drawn proposal
* annotated orthographic concept drawings either CAD or hand drawn
* calculations to estimate design function

**Devising** * produce annotated pictorial drawings of design ideas
* analyse the chosen option to be used as the solution

**Fundamental Engineering calculations** **Quantity estimates** |

| **Week** | **Key teaching points** |
| --- | --- |
| **Term 3**9–10**Term 4**1 | **Task 12: Pre-production*** working drawings – detailed orthogonal drawings
* lists of materials, parts and components
* develop production plan on a timeline

**Producing** * present specifications for the selected solution
 |
| **Task 13: Pre-production skills**Develop production skills; apply safety and practice task/s to develop practical hand and machine skills. Modelling or prototype |
| 2–4 | **Task 14:** **Manufacture of proposed Project two**Using prepared production plan, materials and available equipment; record progress in design folio. |
| 6 | **Task 15: Evaluation of completed Project two**Prepare written report on and photographs of completed product.**Evaluating*** evaluate the final solution in terms of:
* meeting the requirements of the design brief
* function and finish of the product
* variations and changes to the design
 |
| Examination weeks 5–6 | **Task 16: Semester 2 examination** –of approximately 2 hours, using a modified examination design brief from the Year 12 syllabus |