Sample Assessment Outline

Engineering Studies – Mechanical

ATAR Year 12

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Sample assessment outline

Engineering Studies – ATAR Year 12 (Mechanical)

Unit 3 and Unit 4

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Assessment type (from syllabus) | Assessment type weighting (from syllabus) | Assessment task weighting | When/due date/start and submission date | Assessment task |
| **Design** | 30% | 12% | Semester 1Weeks 1–3 | **Task 1 Part A: Design Project 1 – Focus: dynamic vehicles, mechanisms and/or energy harvesting devices*** develop a comprehensive design brief in response to a problem, need or opportunity (student and/or teacher-directed)
* conduct research to identify and assess existing solutions or similar products
* research and critique materials and components relevant to the design brief
* consider different ways to supply energy for efficient and effective functioning of the design
 |
| Semester 1Weeks 4–8 | **Task 1 Part B: Devising – sketches*** produce annotated pictorial sketches and/or drawings of design ideas
* produce annotated third-angle orthographic sketches of design ideas
* compare and analyse alternative designs and justify the choice of options to be used as the solution
 |
| Semester 1Week 14 | **Task 1 Part C: Evaluation Project 1*** evaluate the resulting prototype or working model
	+ meeting the requirements of the design
	+ safety, function, fit and finish
	+ modifications and changes to the design during production
	+ refinements and changes for future development
 |
| 5% | Semester 1Week 13 | **Task 3: Test – Materials; Effects on society, the environment and industry; Energy, work and power; Dynamics (Unit 3 [50%] and Unit 4 [50%])**Multipart questions requiring short answers and calculations to solve specific scenarios in any of the following syllabus content:* Types and classification
* Properties
* Processes
* Factor of safety
* Stress and strain
* Energy
* Constant acceleration in straight line motion
 |
| 8% | Semester 2Weeks 1–3 | **Task 5 Part A: Project 2 – Investigation and design sketches (Focus: static structures or analysis of results from prototype/Project 1)*** define nature of problem and develop a brief and research for Project 2
* develop sketches and working drawings for manufacture of Project 2
* develop a timeline for manufacture
 |
| Semester 2 Week 13 | **Task 5 Part B: Evaluation Project 2*** evaluate the resulting prototype or working model
	+ meeting the requirements of the design
	+ safety, function, fit and finish
	+ modifications and changes to the design during production
	+ refinements and changes for future development
 |
| 5% | Semester 2Week 10 | **Task 7: Test – Mechanisms; Effects on society, the environment and industry; Statics; Trusses (Unit 3 [50%] and Unit 4 [50%])**Multi-part questions requiring short answers and calculations to solve specific scenarios in any of the following syllabus content:* Simple machines and mechanisms
* Calculations
* Unfamiliar formula
* Beams
* Deflection of beams
* Method of sections
* Life cycle analysis of engineered products
 |
| **Production** | 30% | 5% | Semester 1Weeks 9–10 | **Task 2 Part A: Produce specifications for the selected solution for Project 1** * present specifications for the selected solution
* create annotated pictorial drawings
* create orthographic drawings and sketches that are third-angle projections that comply with the accepted standards for
	+ lines – outlines, hidden detail and centrelines
	+ dimensioning – linear, radii, circles, spheres and part spheres, through holes and partial depth with flat base
* select materials with justification of choices
* present a parts lists
* present costing of the project, i.e. the prototype or working model
 |
| 10% | Semester 1Weeks 11–13 | **Task 2 Part B:** **Production of Project 1*** display project management skills for timely development and testing of project
* construct a prototype or working model by selecting and using appropriate tools and machines, and by following safe work practices
* test those aspects of the prototype or working model that have been completed for correct function and document using checklists and test data
* keep a production journal detailing practical tasks, issues and solutions
 |
| 5% | Semester 2Week 4 | **Task 6 Part A: Produce specifications for the selected solution for Project 2 (or development of Project 1)** * present specifications for the selected solution
* create dimensioned pictorial and orthographic drawings
* create orthographic drawings and sketches that are third-angle projections that comply with the accepted standards for
	+ lines – outlines, hidden detail and centrelines
	+ dimensioning – linear, radii, circles, spheres and part spheres, through holes or partial depth holes with flat base
* select materials with justification of choices
* present a parts lists
* present costing of the project, i.e. the prototype or working model
 |
| 10% | Semester 2Weeks 10–13 | **Task 6 Part B:** **Production of Project 2 (or development of Project 1)*** display project management skills for timely completion and testing of project
* construct the prototype or working model by selecting and using appropriate tools and machines, and by following safe work practices
* test the prototype or working model for correct function and document using checklists and test data
* keep a production journal detailing practical tasks, issues, and solutions
 |
| **Examination** | 40% | 10% | Semester 1Week 15 | **Task 4: Semester 1 examination based on Unit 3 content**Three hours using the examination design brief from the ATAR Year 12 syllabusSection One: Core content (50% of the total examination)* 5–8 short answer questions, without parts (10%)
* 4–6 questions, each with parts (40%)

Section Two: Specialist engineering field – Mechanical (50% of the total examination)* 5–8 short answer questions, without parts (10%)
* 4–6 questions, each with parts (40%)
 |
| 30% | Semester 2Week 15 | **Task 8: Semester 2 examination based on Unit 3 (33%) and Unit 4 (67%) content**Three hours using the examination design brief from the ATAR Year 12 syllabusSection One: Core content (50% of the total examination)* 5–8 short answer questions, without parts (10%)
* 4–6 questions, each with parts (40%)

Section Two: Specialist engineering field – Mechanical (50% of the total examination)* 5–8 short answer questions, without parts (10%)
* 4–6 questions, each with parts (40%)
 |
| **Total** | 100% | 100% |  |