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 1  Weeks 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 1  Weeks 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 1  Week 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 1  Week 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 2  Weeks 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 2  Week 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 1  Weeks 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 1  Weeks 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 2  Week 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 2  Weeks 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 1 Week 15 | **Task 4: Semester 1 examination based on Unit 3 content**  Three hours using the examination design brief from the ATAR Year 12 syllabus  Section 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 2 Week 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 syllabus  Section 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% |  | |