

# Sample Assignment Brief

AQA Level 3 Technical Level Engineering: Mechatronic Engineering  
Mechatronic Project Management

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|-------------------------------|--|------------------------|--|
| <b>Tutor/Assessor Name</b>    |  |                        |  |
| <b>Assignment Title</b>       |  |                        |  |
| <b>Date Assignment Issued</b> |  | <b>Submission Date</b> |  |

| Task number | Grading criteria to be evidenced in the task |
|-------------|--|
| Task 1      | P1, P2, M1, M2, D1                           |
| Task 2      | P3, P4, P5, P6, P7, P8, M3, M4, M5           |
| Task 3      | P9, P10, P11, M6, D2                         |
| Task 4      | P12, M7, D3                                  |
| Task 5      | P13, P14                                     |

| Learner Authentication  |             |
|---|-------------|
| <p>I confirm that the work and/or the evidence I have submitted for this assignment is my own. I have referenced any sources in my evidence (such as websites, text books). I understand that if I don't do this, it will be considered as a deliberate deception and action will be taken.</p> |             |
| <b>Learner Signature</b>  | <b>Date</b> |
| <b>Tutor/Assessor Signature</b>   | <b>Date</b> |

## TASK OVERVIEW

For this unit learners must complete a project relating to the production of a mechatronic system.

Ideally, the project brief should be set by an employer in a relevant industry sector; however it could be set by supervisors within the centre (college/school), with appropriate industrial support and input, if that is not possible. The involvement of employers at this stage will ensure that learners follow realistic projects and designs and will give the learner the best possible opportunity to develop their capabilities as a mechatronic engineer.

The project provides an opportunity to apply and practice skills and techniques learned in previous units as well as investigating and developing new areas of interest to support the project objectives.

The projects can address a wide variety of topics, dependent upon the available employers, the resources available to the centre, or the learners own areas of interest. However, it must be relevant to mechatronic engineering and the fusion of mechanical and electronic elements, with computer control.

You will also need to demonstrate research skills, and oral and written communication skills.

## PROJECT MANAGEMENT

Project management is the process and activity of planning, organizing, motivating, and controlling resources, procedures and protocols to achieve specific goals in scientific or daily problems. A project is a temporary endeavor designed to produce a unique product, service or result with a defined beginning and end (usually time-constrained, and often constrained by funding or deliverables). It is undertaken to meet unique goals and objectives, typically to bring about beneficial change or added value.

The temporary nature of projects stands in contrast with normal business operations, which are repetitive, permanent, or semi-permanent functional activities to produce products or services. In practice, the management of these two systems is often quite different, and as such requires the development of distinct technical skills and management strategies.

### **Task 1: PO1 – Understand the requirements for managing and controlling engineering projects effectively (P1, P2, M1, M2 and D1)**

This task is related to researching and evaluating project management techniques. Candidates must demonstrate that they understand, and can identify, management and supervisory techniques that they will meet while undertaking their project, and those they might meet in industry.

#### **You will need to:**

- Investigate different project management techniques for both industry and individual projects that aid reporting and communication, with examples of their application (P1).
- Identify four supervisory techniques which may be used to achieve engineering objectives within an organisation (P2).

You could also compare and contrast different project management methodologies (M1) and different supervisory techniques (M2), and select and justify an appropriate project delivery methodology (D1).

Your evidence from this task will be written descriptions and comparisons of project management techniques and they will form a section of the final report.

## **Task 2: PO2 - Plan engineering projects (P3, P4, P5, P6, P7, P8, M3, M4 and M5)**

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**In this task you use the techniques and methodologies researched in task one to undertake the planning of the chosen project.**

**You will need to:**

- Undertake appropriate research, using a variety of different sources, to inform your project planning (P3).
- Locate, interpret and use information from technical engineering literature. This could include, but is not limited to, technical journals or other publications, symposium reports or information gathered from interviews with practising engineers/subject experts (P4).
- Produce an effective project plan that shows the selection of effective methods, materials, equipment, tools, processes and products which ensure that the operation and maintenance is completed to the appropriate standards (P3 and P7).
- Produce an engineering workshop instruction (P6).
- Outline the relevant legal and ethical requirements, codes of practice and industry standards governing the engineering activities, including health, safety, risk and environmental issues (P8).

You could also justify costs and resources to inform project planning (M3), interpret commercial, technical, and stakeholder requirements (M4), and produce a PEST analysis to support the project plan (M5).

**Your evidence will include:**

- A detailed project plan that identifies all objectives and correctly orders all activities. The plan need not necessarily be one document but could be made up of a timetable or scheduling plan, flow charts and priority calculations and can be produced using proprietary software or sketched out by hand. It must include but not be limited to:
  - all activities
  - risks and quality checks
  - resources
  - costs that include an estimation of the production costs. Note that it is expected that hourly rates for all personnel be included (which may also include an estimation of the cost of candidates own time) using comparisons with relevant jobs and pay grades within industry, as well as estimates for any services where relevant or appropriate.
- A description as to how the plan combines the technical requirements of the project with the needs of all stakeholders – including consideration of the final user and any commercial stakeholder requirements.

## **Task 3: PO3 - Manage engineering projects (P9, P10, P11, M6 and D2)**

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**In this task you will use the techniques and methodologies you have researched and described in previous tasks together with the project plan to assume the role of project manager and manage your chosen project.**

**You will need to:**

- Demonstrate that equipment, tools, processes have been correctly applied/used (P9).
- Demonstrate that appropriate quality processes are in place to manage potential risks (P10).
- Show that project adjustments are made to ensure the project is delivered to the appropriate standards (P11).

You could also demonstrate, having met the project objectives – using the agreed level of resources, the effective and efficient management to meet deadlines (M6), and shown the ability to independently manage all aspects of the projects delivery to the required standard – time savings and/or improvements to the original project plan (D2).

**Your evidence will include:**

- A demonstration that all risk assessments have been complied with eg witness statement, log-book entry or photographic evidence.
- A detailed log book which has notes and comments to show project progress as well as changes/actions that arise during execution of the project and a revised project plan – especially where an action results in a change to deadlines. If no changes are required then this too must also be noted.

#### **Task 4: PO4 - Evaluate engineering projects (P12, M7 and D3)**

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The final outcome of following the plan will be the completion of the project where the candidate, as acting project manager, must demonstrate that:

- It was completed to the expected standard.
- It met all the intermediate and final project deadlines.
- All aspects of the engineering specification were complied with.

This is often called a 'lessons learnt exercise' and allows a critique of the project as a whole.

You will need to:

- Evaluate whether the project outcomes were achieved within budget (P12).
- Show if the benefits resulting from the completion of the project have been achieved (P12).

You could also demonstrate how stakeholder feedback has been considered in the project evaluation (M7) and, using an evaluation of the whole project process, make recommendations for future improvements (D3).

Your evidence from this task will be a written evaluation of the project management used to deliver the process and it will form a section of the final report.

#### **Task 5: PO5 - Present project information (P13 and P14)**

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**In industry, following large projects and 'lessons learnt' exercises it is common practice for the project manager to compile a project report and presentation for management.**

**You will need to draw on the entire task undertaken previously to:**

- Produce a coherent and well-structured project records (P13).
- Produce a final project report which must be written in a technical manner and include, but not be limited to, relevant drawings/circuit diagrams, sketches, charts and graphs, as well as a bibliography and contents listing (P13).
- Produce a presentation of the project for two audiences. One should be in the form of a traditional presentation eg for a management team, whilst the second presentation can be in another format, for example, a video presentation or other use of multimedia (P14).

Your final evidence for all of the above tasks will include:

| <b>Submission Checklist (please insert the items the learner should hand in)</b>             | <b>Confirm submission</b> |
|--|---------------------------|
| Project plan   |                           |
| Engineering workshop instruction   |                           |
| List of the resources required   |                           |
| Production plan  |                           |
| Risk assessments   |                           |
| Progress records/project diary, including any test records                                   |                           |
| Annotated pictures of the finished product   |                           |
| A project report that includes descriptions and comparisons of project management techniques |                           |
| Two separate presentations   |                           |
| Witness statements   |                           |
| <b>Learner - please confirm that you have proofread your submission</b>                      |                           |

## Transferable Skills

When completing this assignment, learners will be working towards the transferable skills of problem solving and communication – see section 6.4 of the specification document and the following area for more information about the standards and how they should be evidenced.

For this assignment the transferable skills can be evidenced in the following tasks:

### Written Communication

|            |   |  |  |
|------------|---|--|--|
| <b>CW1</b> | Select appropriate formats for presenting information as a report   | 1.1 Decide on the most appropriate format for the technical report<br>1.2 Plan the structure of the technical report<br>1.3 Make use of any appropriate supporting materials and prepare any other resources needed for the technical report                       | Assignment task 5<br><br>Grading criteria:<br><br><b>P13</b> Produce coherent and well-structured project records and final report |
| <b>CW2</b> | Select and use an appropriate style and tone to suit your audience  | 2.1 Use appropriate language and vocabulary<br>2.2 Structure the technical report to help the audience follow the sequence of the main points and ideas<br>2.3 Use tone and style appropriate to the intended recipient(s)   |  |
| <b>CW3</b> | Organise material coherently, to suit the length, complexity and purpose of your technical report, proof-read, and where necessary re-draft documents | 3.1 Spell, punctuate and use grammar accurately<br>3.2 Make your meaning clear<br>3.2 Use relevant images from appropriate sources to illustrate key points<br>3.3 Proof-read their technical report<br>3.4 Obtain feedback and amend technical report accordingly |  |

### Oral Communication

|            |  |  |  |
|------------|--|--|--|
| <b>CO1</b> | Prepare a suitable presentation  | 1.1 Research suitable topics for the presentation<br>1.2 Research the most appropriate format for the presentation<br>1.3 Plan the structure of the presentation<br>1.4 Make use of any appropriate supporting materials and prepare any other resources needed for the presentation | Assignment task 5<br><br>Grading criteria:<br><br><b>P14 Present</b> information and project evaluation to two different audiences, fully reflecting the audiences' needs in terms of format, style and language |
| <b>CO2</b> | Use language, vocabulary, tone and style suited to the complexity of the topic and | 2.1 Use appropriate language and vocabulary<br>2.2 Structure what is presented to help the audience follow the sequence of the main points and ideas<br>2.3 Use tone and style of presentation   |  |

|            |   |   |  |
|------------|---|---|--|
|            | the context                                     | appropriate to the audience and environment   |  |
| <b>CO3</b> | Use a variety of methods to engage the audience | 3.1 Provide examples to illustrate complex points<br>3.2 Use relevant images from appropriate sources to illustrate key points<br>3.3 Use at least one additional method to engage the audience |  |

## Research Standards

Evidence must clearly show that the learner can:

|           |   |   |  |
|-----------|---|---|--|
| <b>R1</b> | Design a research study   | 1.1 Identify possible topics for research<br>1.2 Choose one topic, identifying appropriate objectives for detailed research, and plan how to carry out the research<br>1.3 Select a variety of resources to gather relevant information and identify appropriate methods and techniques to carry out the research | Assignment task 3<br><br>Grading criteria:<br><br><b>P3</b> Carry out <b>research</b> , using a variety of different sources, to inform project planning |
| <b>R2</b> | Conduct data collection and analysis                                  | 2.1 Collect data using the appropriate methods to test the hypotheses/theories<br>2.2. Carry out an appropriate analysis of the data<br>2.3 Draw appropriate conclusions that are supported by the evidence from the data analysis  |  |
| <b>R3</b> | Present findings of the research and evaluate the research activities | 3.1 Prepare and present results of research<br>3.2 Present the information in a clear and appropriate format adapted to the needs of the audience<br>3.3 Seek feedback and use it to support own evaluation of research skills  |  |