**BTEC Assignment Brief**

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| **Qualification** | Pearson BTEC Level 3 National Diploma in Engineering Pearson BTEC Level 3 National Extended Diploma in Engineering  |
| **Unit number and title** | **Unit 5: A Specialist Engineering Project** |
| **Learning aim(s)** (For NQF only) | **B:** Develop project-management processes and a design solution for the specialist engineering project as undertaken in industry |
| **Assignment title** | Implement project-management processes to develop a solution for an engineering project |
| **Assessor** |  |
| **Issue date** |  |
| **Hand in deadline**  |  |
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| **Vocational Scenario or Context** | Your supervisor is pleased with the work that you carried out to develop and scope out technical solutions to the engineering problem you were given. Your supervisor has now asked you to plan out your project and apply a number of project-management processes to develop a solution to the engineering problem that you have already investigated. You should think through ways to make best use of project-management processes and generate a design solution which takes into account contingency and considers constraints. Remember that there is a possibility that the solution may be implemented if it is an improvement and feasible. |
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| **Task 1** | You completed a feasibility study on possible alternative solutions for Assignment 1; you are now to consider project-management processes before producing a technical specification and then applying the necessary tools to design a solution to the engineering problem.**To do this:**You will first need to implement appropriate project-management processes to plan out your project. Your planning should include:* the resources required for the project
* the time scale of activities
* a critical path analysis including milestones
* a consideration of project contingencies and constraints
* a resource plan which may include reference to the internet, humans, peers, books and equipment
* a project risk and issue log, considering the processes to be followed to avoid ‘crisis management’, and to improve the probability of success/increase the possible competitive advantage of the solution.

With your planning completed and the potential risks identified, you should now apply your understanding of project-management processes during the design of a solution to your given engineering problem. This will be achieved through the production of: i) a technical specification and ii) a design to solve your given engineering based problem.Your technical specification should be appropriate to the engineering problem, considering factors which should include:* function and features, including interfaces
* materials to be used
* standards relevant to the product, system or process
* environmental and sustainability issues
* maintenance and performance requirements.

The technical specification should also consider other relevant factors such as tolerances, security, operational conditions, process capability, reliability and capacity.You should then use your technical specification to produce an optimised design that solves your given engineering based problem; this should include sufficient documentation so that the solution is fully communicated. This could include the provision of engineering drawings, simulations, physical models, computer programs, safety information and other related and appropriate documentation. Full details of the design solution must be provided. The documentation will take into account sustainability and contain details of how the solution has been optimised by iteration within the given constraints set out previously.Finally, you should include an outline test plan for destructive and non-destructive tests (as appropriate) which references the parameters that will demonstrate that the product, system or process is fully functioning as expected.As you progress through the project, you should make sure that you record in a logbook any problems that you encounter and how you have overcome these, and you should keep logging your progress against your plans, critical path analysis etc. Log entries should be frequent. You should also note any discussions you have had (for technical support, progress, feedback etc), and how these have impacted on the development iterations of your design proposal.Your logbook should also include details of your monitoring of the project and how you managed issues (by prevention, reduction etc) where the severity risk was identified as being medium, high or extreme. |
| **Checklist of evidence required**  | Project logbook including the development of a technical specification that shows the application of project-management processes with full details of the problem(s) and solutions, technical support, progress, discussions, group activities and development iterations.A full range of design documentation to communicate the solution, such as engineering drawings, computer-aided drawings (CAD), simulations, physical models, processes or computer programs and other documentation as appropriate (e.g. tables, formulas, pseudocode, outline of key algorithms, descriptions etc). A test plan should also be provided. |
| **Criteria covered by this task:** |
| Unit/Criteria reference | To achieve the criteria you must show that you are able to: |
| 5/B.D2 | Optimise the project-management processes and design solution while allowing for reasonable contingency and considering constraints. |
| 5/B.M2 | Implement project-management processes, including detailed planning and monitoring and proactive risk and issue management. |
| 5/B.M3 | Design a coherent solution, considering alternative approaches. |
| 5/B.P3 | Implement project-management processes, including planning, monitoring and risk and issue management. |
| 5/B.P4 | Produce the technical specification for a solution to an engineering problem. |
| 5/B.P5 | Produce design documentation to detail the solution, including a test plan and taking account of sustainability. |
| **Sources of information to support you with this Assignment** | BooksUher,T. Zantis, A.; Programming and Scheduling Techniques; Routledge 2012; ISBN 9781136860508Barkley, B.; Project Risk Management; McGraw Hill Professional 2004; ISBN 9780071436915Websiteshttps://www.mindtools.com/critpath.html <https://www.projectsmart.co.uk/10-golden-rules-of-project-risk-management.php>**Above are some examples of websites. Further useful resources may be found at** <http://qualifications.pearson.com/en/support/published-resources.html#step1> |
| **Other assessment materials attached to this Assignment Brief** |  |