**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) | | **A:** Investigate an engineering project in a relevant specialist area |
| **Assignment title** | | Investigating an Engineering Project |
| **Assessor** | |  |
| **Issue date** | |  |
| **Hand in deadline** | |  |
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| **Vocational Scenario or Context** | | You are working as a final year engineering apprentice with a large engineering organisation that operate within the electrical and electronic/manufacturing sector.  Your supervisor is pleased with the work that you have done, and is impressed by your understanding of ways in which problems can be solved effectively.  As a result, your supervisor has asked you to investigate a product, within the organisation that can be improved. You have been asked to research the engineering problem and to generate alternative solutions to the problem, and to suggest a preferred idea. There is a possibility that the solution may be implemented later if it is an improvement and feasible. |
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| **Task 1** | | You are going to investigate and evaluate an engineering project/problem on a given theme in order to produce a range of three possible solutions. You will initially research the engineering project/problem before producing a specification which scopes out potential technical solutions.  **To do this:**  Your tutor will provide you with a case study for an engineering product, where there is an opportunity for you to be able to improve the product.    **You need to:**   * Conduct and record your initial research so that you can clarify the details of the engineering project and identify the problem(s) to be solved. Your research should make use of a wide range of suitable and relevant resources that will assist you in solving the problem. * You should then document your use of a range of appropriate creativity tools to help you come up with three potential solutions for the given engineering project/problem. This could be done through a combination of different approaches. * Finally, use your research/creative thinking to produce a technical specification from which you can establish the key design features needed to scope out possible technical solutions. Your technical specification should include information including graphical solutions to the problem, an outline of the required processes and costings and initial technical information.   Having completed your research and devised a technical specification for the solution to your given engineering project/problem, you are now to produce a feasibility study on the three alternative solutions. You should use the results of your feasibility study to justify a preferred solution to the project/problem.  **You need to:**  Identify the criteria on which to base your feasibility study of the three alternative solutions to the engineering project/problem. Your feasibility study should consider a range of factors, and provide information on:   * the potential size and complexity of the problem to be solved * the potential size of the benefits and performance improvements the solutions will bring to the problem * The cost and time that would be needed to develop each solution * any specialist expertise which is required to develop the solutions * the risks in developing the solutions * sustainability issues * legal constraints which are relevant to the solutions   Finally, you should analyse your designs through the use of feasibility assessments and by considering the iterative steps which you followed. You should then justify a preferred solution to the engineering project/problem by carrying out objective testing of each of the proposals.  Having identified a preferred solution through your feasibility study/testing, you should get your tutor to sign off your preferred solution as being possible and achievable given the constraints of both time and resources in your centre. |
| **Checklist of evidence required** | | Research report which includes evidence of investigating initial ideas and possible solutions. Alternative technical solutions should be scoped out and a feasibility study report of the possible solutions included. Other related documents may include diagrams, sketches, photographs, costings and spreadsheets. |
| **Criteria covered by this task:** | | |
| Unit/Criteria reference | To achieve the criteria you must show that you are able to: | |
| 5/A.D1 | Evaluate, using language that is technically correct and of a high standard, at least three realistic solutions to an engineering problem on a given theme and justify a preferred solution. | |
| 5/A.M1 | Assess consistently at least three solutions to an engineering problem on a given theme and recommend a preferred solution. | |
| 5/A.P1 | Research an engineering problem based on a given theme and scope out at least three alternative solutions. | |
| 5/A.P2 | Outline at least three alternative solutions to an engineering problem and select a preferred solution. | |
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| **Sources of information to support you with this Assignment** | | Books  De Bono, E.; Six Thinking Hats; Penguin 2010; ISBN 9780141033051  Websites  https://www.mindtools.com/pages/main/newMN\_TMC.htm problem solving techniques  <http://www.debonogroup.com/six_thinking_hats.php>  https://www.projectsmart.co.uk/elements-of-a-good-feasibility-study.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** | |  |