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**Course:** BTEC Higher National Certificate / Diploma (Engineering)

**Year: 2019/20**

**Unit Number and Title: Unit 1 Engineering Design**

**Assignment No:** 2

**Assignment Title: Formulate possible technical solutions to address a design specification**

**Covers Learning Outcome: LO2 Formulate possible technical solutions to address the student-prepared design specification**

**Student name: …………………………………………………………**

**Issue date: 14th November 2019**

**Due date: 9th December 2019**

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| **Submission date:** |  | **Marking date:** |  |
| **Student name:** |  | **Lecturer name:** | **J Kupper** |
| **Student signature:** |  | **Lecturer signature:** |  |

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| --- | --- | --- | --- | --- |
| Criteria  | Assessment Grading Criteria | Achieved | Evidence | Assessor comment / feedback |
| **P4** | Explore industry standard evaluation and analytical tools in formulating possible technical solutions | *Yes / No* | *Task 1*  |  |
| **P5** | Use appropriate design techniques to produce a possible design solution | *Yes / No* | *Task 2* |  |
| **M3** | Apply the principles of modelling/simulation/prototyping, using appropriate software, to develop appropriate design solutions | *Yes / No* | *Task 2* |  |
| **D2** | Evaluate potential technical solutions, presenting a case for the final choice of solution | *Yes / No* | *Task 3* |  |

**Lecturer general feedback:**

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**How your work will be assessed:**

To provide evidence that you have mastered the essential concepts of Learning Outcome 2 you must make a valid attempt at all the questions.

If you complete the ‘P’ questions satisfactorily you have an opportunity to provide more evidence to show that you can work at MERIT and then DISTINCTION level by making a valid attempt at all the questions that have an ‘M’ and then ‘D’ attached to the question number. To meet MERIT and DISTINCTION criteria you will generally be expected to produce not only correct numerical answers but also, to present your strategy/method in a clear and logical way so that you demonstrate your understanding and where appropriate, your ability to adapt the principles and concepts that you are applying.

**Assignment Brief**

* Before you start work on this assignment, read all of the questions and make yourself aware of the learning outcomes addressed by the assignment.
* Note that each question is directly related to a criterion that it, when appropriately answered, provides evidence for PASS, MERIT or DISTINCTION criteria being met.

Set out your responses so that they are easy to read. Number your answer to each question and where appropriate, identify each part-question as (a), (b) etc. Make sure that your answers quote any formulae being used in symbolic form before values are inserted and show the method/strategy you are applying. Don’t forget to underline (or highlight) your final answer(s).

* Write your name on each of your answer sheets, number the answer sheets sequentially, staple the answer sheets together and hand-in them in with this assignment worksheet. Do not put each page of answers into a separate plastic document wallet.
* This assignment must be submitted by the agreed submission date entered on the front page of this worksheet, unless agreed otherwise by the tutor.

**Task1 (P4)**

With reference to the PDS that you created in Assignment 1:-

Explain the concept and purpose of a Failure Mode Effect Analysis (FMEA). Consider the impact it has on the design process. In what ways would it be relevant to the Marshall Tufflex case study?

Who would be involved in the FMEA process? Indicate how the FMEA links to your PDS.

**Task2 (P5, M3)**

Create at least 2 alternative design options for the Marshall Tufflex case study. Identify and state the critical areas and conduct a simulation (using CAD) showing that these have been taken into account. Show any calculations that you have carried out, and state any assumptions made.

**Task3 (D2)**

Evaluate your design options and show how they meet the Customer Spec. and the PDS.

Select a chosen design option, and justify your selection. You may use selection-matrices or similar techniques. Give a clear explanation of how you have arrived at your choice.