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**LEYTON SIXTH FORM COLLEGE – CENTRE NO: 13409**

**DEPARTMENT: COMPUTING AND IT**

**COURSE: BTEC L3 EXTENDED DIPLOMA IN IT - ACADEMIC YEAR 2013-2014**

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| **Student Name: Usman Basharat Student ID: S1300173 Teacher:** Mrs Niles-Brathwaite | | | | | | | |
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| **Unit No:** 24  **Unit Name:** Controlling Systems Using IT  **Internal Verifier:** Mr A Tahir **Date Verified:** 05/03/2014 | | | | | | | |
|  | | | | | | | |
| **Assignment No:** 3 **Assignment Title:** Designing and implementing control systems  **Assignment Given Out:** 27/05/2014 **Assignment Submission Date:** 13/06/2014  **Learning Outcome:** LO4 - Be able to design and implement control systems | | | | | | | |
| **Task** | **Unit** | **Grading Criteria**  **Reference** | **Grading Criteria** | **Review Date** | **Grade Awarded** | **Date Achieved** | **Page No#** |
| 1 | 24 | P6 | Design a control system | 06/06/2014 |  |  |  |
| 2 | 24 | P7 | Implement a control system | 06/06/2014 |  |  |  |
| 3 | 24 | M4 | Suggest potential improvements to a control system | 06/06/2014 |  |  |  |
| 4 | 24 | D1 | Design a control system that uses different types of sensors [CT1] | 06/06/2014 |  |  |  |
| 5 | 24 | D2 | Evaluate the design and performance of a control system. [IE4] | 06/06/2014 |  |  |  |
| **Assignment Rules:**  Any work submitted after the deadline may not be marked. | | | | | | | |

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| **Student declaration**  I declare that all of the work submitted for this assignment is my own work or, in the case of group work, the work of myself and the other members of the group in which l have worked has not been copied from any source. I understand that if any part of the work submitted for this assignment is found to be plagiarised, none of the work submitted will be allowed to count towards the assessment of the assignment.  **Student Signature: Date:**  **Assessor Signature: Date**: |

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**ASSESSMENT FEEDBACK FORM**

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Unit Number** |  | **Unit Title** | |  | | | |
| **Assignment Title** |  | | | | **Resubmission Date** |  | |
| **Assessors Feedback (**please be specific, addressing the assessment and grading criteria**)** | | | | | | | |
| **Assessment Criteria to be addressed** | **Feedback from Assessor** | | | | | | **Achieved Yes/No** |
|  |  | | | | | |  |
| **Literacy Skills assessed for development** | | | | | | | |
| **Literacy issue assessed (please circle)** | | | **Comment for development** | | | | |
| **Structure, meaning, punctuation, spelling, referencing, bibliography, plagiarism or specify** | | |  | | | | |

**Signed: Student ………………………………………… Date: …………………….……..**

**Signed: (Assessor) ……………………………………… Date: …………………………..**

**IV Signature: ……………………………………………… Date: ……………………………**

**Scenario**

The training manager at Dynamic Control Systems (DCS) has asked your team to design, implement, test, improve and document a demonstration robot that can be used to induct junior employees into robotics. The manager has insisted that the robot should have at least two motors to give it mobility and a sensor to make it sensitive to external objects. A detailed project description that outlines the project duration, team collaboration details and the deliverables has been included at the end of this document.

You will need to:

**Task 1**

* Produce full design and a test plan for a motorized robot that has at least one sensor. **(P6)**
* Produce full design and test plan for a motorized robot that includes different types of sensors. **(D1)**

**Hints:**

**Test plan table layout**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Test number** | **Description** | **Input data/values** | **Expected outcome** | **Actual outcome** |
|  |  |  |  |  |

**Design:** Use flowcharts, storyboard and pseudocode for design.

**Task 2**

* Based on the designs you have produced, assemble and implement a robot which meets the manager’s requirements. Photos will be taken as evidence and an observation record will be completed by your teacher. **(P7)**
* Test the robot and complete the test plan table shown in task 1.
* Produce a brief report suggesting improvements to the robot following testing. **(M4)**

**Task 3**

* Produce a critical evaluation of the design and performance of the robot that you have implemented. You will include the good points about the design and performance, any less good points, and comments on how well it meets the user need, any specific points where it does not meet that need, and any other issues related to design and performance. **(D2)**

**Logic & Lego Project**

**Due Date:** You have four lessons to complete this project

**Project Description**

This project will be to program the robot so that it can react when a sensor detects an external object.

The requirements of the project are:

* You will work in teams of 3-4 people.
* You will complete a flow chart outlining your algorithm.
* The team’s Lego kit will only be distributed once the team has completed the flow chart.
* Your robot must be programmed to move forward, backwards, turn and stop when a sensors detects an obstruction or external object.
* The robot can be placed on the flow and in any way that the team sees fit.
* Your robot obviously must be able to turn effectively for this project; so feel to alter the design of the robot to make turning even more efficient.
* All team members are expected to work together on all aspects of the project; including brainstorming the idea, designing, constructing the robot out of Lego, and programming.

**Requirements**

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| Lego MindStorms Development |
| Lego Robot Design - Flow Chart & Pseudocode  Test plan  Construction  Testing  Making Changes  Evaluation  Programming |

**Other Notes**

Each team will be required to demonstrate their robot as well as email their designs to the teacher.