NATIONAL INSTITUTE OF BUSINESS MANAGEMENT

BSc (Hons) Computing-2nd Year [HIGHER DIPLOMA IN SOFTWARE ENGINEERING] (HDSE24.1F/Matara)

ROBOTICS

Hand in date 30th May 2024

- This Assignment contains five tasks.
- The total marks obtainable for this assignment 100.
- This course work accounts 100% for the course assessments.

Objectives:

1. Develop own simple robot for special given task(s)
2. Troubleshoot robots – hardware & software.
3. Explain How machine was built, how to design.
4. Explain intermediate knowledge of body and brain of a robot.
5. Apply programming techniques appropriate to embedded systems.

Introduction

Robotics combines science, engineering, and technology to design, construct, operate, and use machines programmed to replicate, substitute, or assist humans in completing tasks of varying complexity. These machines are known as robots.

Scenario

In this course work you are assigning to do a research project to create a Robotic application which is useful in our day today life using microcontrollers, Flip Flops, Counters so on. You may use any sensors and actuators as you wish.

General Guidelines:

Students can do this research project as a Group Project of Maximum 5 Members in each team.

<u>Task 01 –Proposal Submission- 10 Marks</u>

- Prepare a maximum three pages proposal for your proposed research project.

  Proposal is the plan for your research project. It provides the rationale for the research, the research objectives, expected functionalities and the proposed methods.

Proposal should include followings.

1. Introduction

Include the title of your proposal, your name, course/institution details, and date.

Objective: Clearly state the objective of your proposal and what problem it aims to solve or what innovation it proposes.

2. Problem Statement

Identify the Problem: Describe the specific problem or challenge in robotics that your proposal addresses.

Importance: Explain why solving this problem is important and how it contributes to the field of robotics.

3. Budget

Cost Breakdown: Provide a breakdown of the budget required for the project, including costs for materials, equipment, personnel, etc.

4.Gantt Chart

- Upload the PDF of the proposal on or before **02nd June 2024 to LMS**

Task 02 –Progress 01- 20 Marks

Each group have to do a presentation addressing the following.

1. Introduction

Include the title of your project, Team with registration numbers.

Objective: Clearly state the objectives of your project and what problem it aims to solve or what innovation it proposed.

2. Problem Statement

Identify the Problem: Describe the specific problem or challenge in robotics that your project addresses.

Importance: Explain why solving this problem is important and how it contributes to the field of robotics.

3. Literature Reviews

Review of Existing Solutions: Briefly discuss existing solutions or research related to your project.

Gap Identification: Highlight the gaps in current solutions or areas where improvements are needed.

4. Proposed Solution

Overview: Provide an overview of your proposed solution.

5. Methodology

Implementation Plan: Outline the steps or methodology you will follow to develop and test your solution.

Resources Required: Mention the resources, equipment, and expertise needed for implementation.

Timeline: Provide a timeline or schedule for the project, including milestones and deadlines.

6. Expected Results

Outcome: Describe the expected outcomes or results of implementing your solution.

Design concept: expected design.

Duration of the Presentation - Maximum of 15 minutes Presentation

Each student in the group must be presented.

Presentation Deadline 12th June 2024.

Task 03 –Progress 02- 20 Marks

Students need to do a demonstration with explanation about the project using a video clip along with the prototype built.

Video should include followings.

1. Introduction

Small introduction about your project.

2. Proteus Simulation

Completed simulation in proteus for expected functionalities of the proposed system.

3. Completed Mechanical Design.

Proper explanation to each sensor and actuator used in prototype.

Video should be sent via Email/Drive link on or before the given dead line.

Deadline 07th July 2024.

Task 04 – Final Report- 20 Marks

Write a report based on your project.

Report should include followings,

- Abstract
- Acknowledgment
- Table of Content
- Table of Figures
- Introduction
- Literature Reviews
- Methodology
- Discussion
- Future Implementations
- Reference
- Gantt Chart

Final Report of the project should upload to the LMS on or before **16th July 2024**

Task 05 – Final Presentation and VIVA 30 Marks

Presentation – 10 Marks

Each group have to do a presentation addressing followings.

- Introduction about your project
- Demonstration of working Robot.
- Problem you faced and how you overcome them.
- Advices for future researchers
- Future Implementations

Each Student of the group should present.

VIVA – 20 Marks

During the VIVA Session each student going to evaluate.
Presentation date will be **17th July 2024**

End of the Assignment