COURSE PROJECT GUIDELINES

Course Project:

The project is completed as group work with no more than three students per group. During week 4, the groups will be formed along with the project title and requirements. 33% of the project marks will be assigned during the tutorial sessions using mini-tests assigned by the tutorial instructor. For more details regarding the project requirements, refer to the project file posted by the course coordinator during week 4.

Proposed Project Topic:

Student can choose their own topics as long it is in line with the course materials which includes dynamics and MATLAB programming. If a student chooses their own project, they should prepare a proposal similar to the below project contents.

The following suggested project can be used

1. Projectile; an object with a mass "M" was launched at origin with a velocity "V" and angle "α".
2. The origin is located at a distance "D" of a building
3. The building has a height "H"
4. The object must land in a basketball ring located behind the building with the following details:
    - 3 meters above the ground
    - 6 meters away from the building
5. The project works should contain the following as a minimum:
    - Analyze the object movements using the dynamics equations
    - Complete MATLAB programming to analyze and plot the object movement
    - Have the ability to check the location of the object at any required moment
    - Have the ability to check the maximum height the object can reach
    - Create a Matlab application where the input is D and H, the output will be the velocity "V" and angle "α".
    - The program should have graphing options with and without GUI
    - A report must be submitted including the codes
    - Include the operating conditions of the code based on the input data (D & H)

Structure of the Final Report

The final report must include the following sections:

- Title Page
- Acknowledgments
- Summary
- Table of Contents (if applicable)
- List of Tables (if applicable)
- List of Figures (if applicable)
- Chapter 1: Introduction and Background (10 marks)
    - Identify the problem
    - List the objectives
    - List the outcomes
- Chapter 2: Theoretical Design (30 marks)
    - Complete the analysis of the dynamics using equations from lectures
    - Highlights the impacts of different conditions on the theoretical analysis
- Chapter 3: MATLAB Coding (50)
    - Include MATLAB coding
    - Include an explanation for the completed code/s
    - Include graphs for each condition
- Chapter 5: Conclusions (10 marks)
    - Summarize the purpose of the project, the objectives, and the best approach used
    - Summarize the final outcomes of the completed code
- References (if applicable)
    - Number and cite all your references
    - Be consistent in the citing style that you use
- Appendices (if applicable)
    - Add any additional information related to the project analysis

Final Report Style Requirements

All reports must be written using Microsoft Word Document.

- Margins
    - 1 inch left from top, bottom and right
    - 1.25 inch for the left margin
- Indenting
    - Each paragraph should start from the beginning of the far left
    - An empty line should be inserted between paragraphs
- Page Numbers
    - Should be at the far right of the page.
- Spacing
    - Double line spacing
- Figures and Figure Captions
    - Figures must be inserted right after the paragraph where the text refers to it
    - Figure captions must be centered below the figures
- Tables and Tables Captions
    - Tables must be inserted right after the paragraph where the text refers to it
    - Table captions must be centered above the table
- Equations
    - Use equation editor
    - Number each equation right next to it using parentheses; example: Eq. (1)
- References and Citations
    - Cite each reference in text using squared brackets at the end of the sentence; example: sentence to be referenced [1].
    - Be consistent in the reference formatting style
    - Use cross-reference option