**TEKNOFEST**

**AEROSPACE AND TECHNOLOGY FESTIVAL**

**AGRICULTURAL UGV COMPETITION**

**PRE-DESIGN REPORT**

**PROJECT NAME**

**………………………………**

**TEAM NAME**

**………………………………**

**APPLICATION ID**

**………………………………**

**CONTENT**

[1. Abstract 3](#_Toc64037879)

[2. Team Organisation 3](#_Toc64037880)

[3. Analysis of Competition Rules and Design Study Objectives 3](#_Toc64037881)

[4. Vehicle Features 3](#_Toc64037882)

[5. Engine Design 3](#_Toc64037883)

[6. Transmission and Palette/Wheeled System 3](#_Toc64037884)

[7. Electronic Design of The System 3](#_Toc64037885)

[8. Communication System 4](#_Toc64037886)

[9. Energy and Power Planning 4](#_Toc64037887)

[10. Mechanical Design 4](#_Toc64037888)

[11. Software and Data Streaming Architecture 4](#_Toc64037889)

[12. Autonomous Driving Algorithms 4](#_Toc64037890)

[13. Safety Precautions 4](#_Toc64037891)

[14. Reference 4](#_Toc64037892)

# Abstract

In this section, general introductory information about the vehicle and system to be prepared for the competition should be given. The design process, acquired capabilities, electronic components and specific aspects of the design should be emphasized. The task to be performed by the autonomous vehicle should be briefly explained and general information about the performance of the vehicle that will perform this task should be given.

# Team Organization

In this section, general introductory information about team organization and capabilities should be given. An organizational chart showing the sharing of work in the UGV Autonomous Vehicle design process in agriculture and who are employed should be shown. At this stage, personal information of team members should not be shared. The work packages to be used in the vehicle design process should be shown with the "work time chart". In addition, the main work packages should be briefly explained with their requirements and goals.

# Analysis of Competition Rules and Design Study Objectives

In this section, the results of the study on what kind of features the vehicle to be used for the competition should provide will be explained by using the competition rules and scoring equations. Targets will be determined to be used in the design study.

# Vehicle Features

Within the scope of the competition, a vehicle with autonomous driving interfaces will be used. In this part of the report, detailed information about the vehicle to be used should be given, focusing on autonomous driving interfaces.

# Engine Design

Technical information about the engine system used or designed will be given in this section. It must be shown that the engine is compatible with the task. Necessary engine calculations should be made under this heading.

# Transmission and Palette/Wheeled System

In this section, information about the designed transmission and palette/wheeled system will be given. How this transmission and palette/wheeled system is compatible with the conditions of the competition should be explained in technical terms. The transmission and palette/wheeled system design should be added under this heading.

# Electronic Design of The System

The electronic components used in the designed UGV, their installation design and their connection with each other should be explained here. The electricity distribution system should also be explained in this section.

# Communication System

All communication components inside or outside the vehicle, especially between the UGV and the controller, should be explained in this section. Range and antenna information should be shared about the wireless communication systems to be used.

# Energy and Power Planning

The power calculations of the designed UGV, how this power will be distributed from the energy source to the relevant electronic or mechanical components, the capacity of the distribution infrastructure should be explained in this section. How many hours the system will work should be calculated theoretically.

# Mechanical Design

The entire mechanical design of the vehicle, moving or not, should be described in this section. Designs should be added to this section.

# Software and Data Streaming Architecture

All software developed to use a function on the vehicle used for data acquisition, processing, evaluation or other purposes, data flow between these software should be explained in this section. The working algorithm of the system should be explained in a diagram.

# Autonomous Driving Algorithms

In this section, information about autonomous driving algorithms should be given in order to track the whole field in the working width determined in the field.

# Safety Precautions

Measures to be taken for possible dangerous situations will be determined during the test phase and during the competition, and information will be provided about the systems planned for this.

# Reference

**Addition Notes:**

* Each report should start with a cover page and should include a "Table of Contents" page.
* Reports pages should be numbered consecutively.
* The group members who prepared the sections should be specified.
* The font type should be selected as "Times New Roman", "Font size 12".
* Compliance with academic report standards is necessary.

**Pre-Design Report scoring will be made according to the template below.**

|  |  |  |
| --- | --- | --- |
| **Section** | | **Scoring** |
| 1 | Abstract | 5 |
| 2 | Team Organisation | 5 |
| 3 | Analysis of Competition Rules and Design Study Objectives | 5 |
| 4 | Vehicle Features | 10 |
| 5 | Engine Design | 10 |
| 6 | Transmission and Palette/Wheeled System | 10 |
| 7 | Electronic Design of The System | 5 |
| 8 | Communication System | 5 |
| 9 | Energy and Power Planning | 5 |
| 10 | Mechanical Design | 10 |
| 11 | Software and Data Streaming Architecture | 10 |
| 12 | Autonomous Driving Algorithms | 10 |
| 13 | Safety Precautions | 5 |
| 14 | Reference | 5 |

|  |
| --- |
| **NOTE ON REPORT DRAFT** |
| **- The 14 items above will be explained in maximum 12 (twelve) pages.**  **- A maximum of 4 (four) images will be sent as attachments.**  **- It will be a maximum of 15 pages including cover, description and visual.**  **- All reports should be written in accordance with academic report standards.**  **- Each report should include a cover page.**  **- Font: Times New Roman, Size: 12, Line Spacing: 1.15. Justified on both sides, page margins should be 2.5 cm top-bottom-right-left.**  **- The sentences in the report should not be the same and repetitive.** |