COE 485: Senior Design Project

Project Plan — Template

**Title**

Design & Implementation of a Multi-car Tram System with Virtual Tracks

**Description**

Need to design and implement a multi-car tram with no tracks! The pilot car is controlled (speed and direction) from a remote computer, while all trailing cars follow the exact path of the pilot car.

**Supervisor**

Dr. Muhammad Elrabaa

**Team**

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**Outcome**

A complete prototype with at least three cars (pilot + 2 trailing cars) with a user interface SW on a PC that allows us to drive the pilot car.

**Requirements**

* All cars must maintain the same speed with a maximum error margin of 5% of pilot car speed(maximum speed determined later based on equipments limitation)
* All cars must maintain the same Distance between each other with a maximum error margin of 5%(distance between car determined later based on car size)
* The user interface controls the speed and steering of the pilot car.
* Speed control down min is 0 and max 1 meter/second
* Steering angel resolution is decided based on the limitation of the equipment min 0 max 30 degree.

**Timetable**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Task id** | **task** | **Team assignment** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **14** | **15** |
| **1.0** | **Hardware(microcontroller, car components, feedback sensors)** | **A** |  | **x** | **x** | **x** | **x** |  |  |  |  |  |  |  |  |  |  |
| **1.1** | **Deciding** | **A,B,F** |  | **x** |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **1.2** | **Ordering** | **F** |  |  | **x** | **x** |  |  |  |  |  |  |  |  |  |  |  |
| **1.3** | **Hardware setup** | **A** |  |  |  |  | **x** |  |  |  |  |  |  |  |  |  |  |
| **2.0** | **Software** | **B** |  |  |  | **x** | **x** | **x** | **x** | **x** | **x** |  |  |  |  |  |  |
| **2.1** | **Implement algorithms** | **A,B,F** |  |  |  |  |  | **x** | **x** | **x** | **x** |  |  |  |  |  |  |
| **2.2** | **Implement UI** | **B,F** |  |  |  | **x** | **x** | **x** |  |  |  |  |  |  |  |  |  |
| **3.0** | **Communication(pilot car and trailing cars)** | **F** |  |  |  |  | **x** |  |  |  |  |  |  |  |  |  |  |
| **4.0** | **Finalizing project** | **F** |  |  |  |  |  |  |  |  |  | **x** | **x** | **x** | **x** | **x** | **x** |
| **4.1** | **Testing** | **A,B** |  |  |  |  |  |  |  |  |  | **x** | **x** | **x** | **x** |  |  |
| **4.2** | **Debugging** | **A,B,F** |  |  |  |  |  |  |  |  |  |  | **x** | **x** | **x** |  |  |
| **4.3** | **Demo** | **A,B,F** |  |  |  |  |  |  |  |  |  |  |  |  |  | **x** | **x** |
| **5.0** | **Report** | **A,B** |  | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** |
| **5.1** | **Documenting** | **A,B,F** |  | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** |  |  |
| **5.2** | **Presentation file** | **A,B,F** |  |  |  |  |  |  |  |  |  |  |  |  | **x** | **x** | **x** |

\* A: Ayman , B:Basil , F: Faisal