**EGR 302 – Engineering Design and Documentation**

**Deliverable 2: Project Management**

Team Name: RPMs

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Client’s Name: Dr. Xu

Version: 1

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**2.1 Work Breakdown Structure (WBS)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Task Name | Description | Deliverables/ Checkpoints | Duration (Hours) | People | Predecessors |
| 1 | Project Management |  |  |  |  |  |
| 1.1 | Understand Client Requirements | Develop a clear understanding of the client's expectations and what the project is meant to achieve. | Deliverable 1 | 2 | Joshua |  |
| 1.2 | Data Collection | Collect data to find out what the project requires |  | 2 | Tim |  |
| 1.3 | Consumer Needs | Determine the needs of the consumer so that the project achieves exactly what he or she wants it to |  | 2 | Brian |  |
| 1.4 | Research Prior Design | Research past technology to avoid repeating their work and mistakes |  | 2 | Dylan |  |
| 1.5 | Objective Tree | Describes the objectives of the projects and details of those objectives |  | 2 | Jordan |  |
| 1.6 | Pairwise Charts | Determines the Weight that each objective is assigned and why |  | 2 | Austin |  |
| 1.7 | Problem Definition | Uses the research and charts to re-evaluate the problem statement |  | 2 | Joshua |  |
| 2 | Engineering requirements |  |  |  |  |  |
| 2.1 | Examine Functional Necessities | Determine what the project is meant to do and begin considering ways to do it. | Deliverable 2 | 3 | All | 1 |
| 2.2 | Develop Initial Requirements | Determine what is required in the beginning to understand the parameters our device will operate under |  | 2 | Tim |  |
| 2.3 | Eliminate Extraneous Ideas | "think free" and then eliminate the ideas that obviously will not work e.g elephants controlling dishwashers |  | 1.5 | All |  |
| 3 | Concept Development | Develop the ideas on how to accomplish our goals and implement relevant technology and ideas. | Deliverable 3 | 2 | All | 1,2 |
| 3.1 | Brainstorm | Come up with free ideas that we might be able to use or combine to make one good idea | Deliverable 4 | 2 | All |  |
| 3.2 | List All Alternates | list brainstormed ideas and determine a variety of ideas that can be used |  | 2 | All |  |
| 3.3 | Evaluate Possibilities | Evaluate the ideas we came up with and the techniques we can use to make our project better. Objectively rank them to give a better understanding of which is the best to use |  | 2 | Dylan |  |
| 3.4 | Eliminate Extraneous Ideas | "think free" and then eliminate the ideas that obviously will not work e.g elephants controlling dishwashers |  | 1 | Brian |  |
| 4 | Circuit Development | Design and implement the circuitry required for the device. | Circuitry Design/simulator | 5 | Austin/Tim | 3 |
| 4.1 | Verification | Verify that the circuit works | simulation | 3 | Austin/Tim/Joshua |  |
| 4.2 | Purchase Components | Buy components of the circuit for testing and implementation | Review with Client | 2 | Brian |  |
| 4.3 | Circuit Creation | build circuit to prepare for implementation |  | 3 | Dylan/Jordan |  |
| 4.4 | Circuit Testing | implement the circuit and test it |  | 3 | Dylan/Jordan |  |
| 5 | Software Development | Design and test the software required to interface with the hardware | Input/output recognition | 3 | Tim/Joshua | 3 |
| 5.1 | Code Generation | Generate code to interface with the circuit |  | 3 | Joshua/Jordan |  |
| 5.2 | Code Testing | test the code to make sure it works |  | 3 | Joshua/Jordan |  |
| 5.3 | Code Implementation | implement the code in the circuit by loading it on the microcontroller |  | 3 | Tim/Austin |  |
| 6 | Mechanical Development | Design and create the hardware required | AutoCad Design | 5 | Austin/Brian | 3 |
| 6.1 | Verification | Verify the mechanical design is sound |  | 3 | All |  |
| 6.2 | Purchase Components | buy the components and ensure that the parts fit together | Review with client | 2 | Brian |  |
| 6.3 | Hardware Creation | Begin construction of the device |  | 2 | Brian/Austin |  |
| 6.4 | Hardware Testing | Test the device and ensure it does all that is required | Final AutoCad Design | 3 | Brian/Austin |  |
| 7 | Compilation | Compile all portions of the project to create the working model | Draft Final Report | 2 | All | 4,5,6 |

The Work Breakdown Structure (WBS is an analysis of the tasks and deliverables that need to be accomplished. This WBS analyzes from start to finish the E-Wand project for Team RPMs. It gives a detailed breakdown of the tasks required for completion. Each task is stated within the second column and then a description of the task follows in the next. The tasks are then broken down even more into separate milestones. Also included is the expected amount of hours for each task, the name of each person assigned to the milestone, and if there is another task that needs to be accomplished prior to starting the current task.

The steps in this project include first the general design process. This involves knowing the clients requirements and developing ideas that can fit those requirements. Then the ideas are examined and the engineering specifications are created to find out the practicality of the ideas and be able to create the ideas. After these are all examined and verified, then the components are purchased. After that the individual parts can be created including the mechanical design, the software design and the circuit design. These are compiled and the final result can be completed and tested

**2.2 Gantt Chart**