The following eight reports in this appendix are dated for the entire duration of the project, excluding Thanksgiving week. These reports outline completed tasks, upcoming goals and individual responsibilities for each week.

**MECH 328 Weekly Progress Report *Dates: September 4 - 7***

Group: 10 Project Title: TrailRider 5.0

**Last Week’s Goals**:

1. To familiarize ourselves with the project documents and create target specifications
2. To begin initial research
3. Set-up online google drive for document storage
4. Create a preliminary Gantt chart to manage upcoming week’s timeline

**Last Week’s Activities**:

|  |  |  |  |
| --- | --- | --- | --- |
| Name | Activities | Hours Worked | |
| Last Week | Total |
| Andrea | * Found an article related to the project * Read the project and course guide document | 1 | 1 |
| Carson | * Found an article related to the project * Read the project and course guide document * Created weekly report | 2 | 2 |
| Julia | * Found an article related to the project * Read the project and course guide document * Created target specifications and preliminary Gantt chart for weekly report | 2 | 2 |
| Lukas | * Found an article related to the project * Read the project and course guide document | 1 | 1 |
| Ratthamnoon | * Found an article related to the project * Read the project and course guide document | 1 | 1 |
| Stephen | * Found an article related to the project * Read the project and course guide document | 1 | 1 |
| Total |  | 8 | 8 |

**Summary of progress**:

* Many resources have been compiled during class and the team is familiar with the project.
* A google drive has been created and organized into appropriate folders.
* A preliminary Gantt Chart and Target Specifications have been created.

**Assessment of Overall Progress:**

* The team has not yet met outside of class time. Meetings this week will facilitate productivity and allow the design process to begin.
* Modifications to the target specifications and Gantt Chart may occur in the next week.

**Goals for Next Week**:

1. To discuss team goals, expectations, strengths and weaknesses. Also to distribute tasks accordingly.
2. To work through an iteration of the design process from finalizing need statements to function generation.

**Action Items for Next Week**:

|  |  |  |
| --- | --- | --- |
| Name | Action(s) | Due Date(s) |
| Everyone | Buy a logbook | Sept. 9 |
| Everyone | Discuss team expectations, goals and strengths | Sept. 9 |
| Everyone | Determine who will be responsible for each action | Sept. 9 |
| TBD | Brainstorm needs for the rider, the sherpas, BCMOS, the public and search and rescue | Sep. 9 |
| TBD | Determine the current specifications for the Trailrider (cost, weight, length, width etc.) | Sept. 9 |
| TBD | Estimate the worst-case acceptable value for these specifications with justification | Sept. 11 |
| TBD | Create a high-level Gantt chart with important deadlines to work from | Sept. 9 |
| TBD | Compile interesting/useful resources from class list | Sept. 11 |
| TBD | Perform function decomposition on the Railrider based on needs | Sept. 11 |
| TBD | Begin brainstorming solutions to each function | Sept. 11 |

**MECH 328 Weekly Progress Report *Dates: September 8 - 15***

Group: 10 Project Title: TrailRider 5.0

**Last Week’s Goals**:

1. To discuss team goals, expectations, strengths and weakness and to distribute tasks accordingly.
2. To work through an iteration of the design process from developing needs statements to function decomposition.
3. To identify our target market with justification.

**Last Week’s Activities**:

|  |  |  |  |
| --- | --- | --- | --- |
| Name | Activities | Hours Worked | |
| Last Week | Total |
| Andrea | * Researched search and rescue regulations and compatibility * Researched potential target markets, client needs * Report template | 8 | 9 |
| Carson | * Researched alternative products to the TrailRider, including the Joelette. * Collaborated on target specifications with the team * Started this weekly report | 8 | 10 |
| Julia | * Updated Gantt Chart progress each meeting * Researched biomechanics and wheelchair properties * Determined constraints and needs sacrifices | 8 | 10 |
| Lukas | * Researched comparable products and solutions * Generated a summary of the target market | 8 | 9 |
| Ratthamnoon | * Researched Canadian disability statistics * Worked on target specifications, target market, and needs & stakeholder, and project scope * Finished this weekly report | 8 | 9 |
| Stephen | * Gantt chart * Function decomposition * Researched needs and stakeholders | 8 | 9 |

**Summary of progress**:

* Preliminary research has been conducted on several alternatives to the TrailRider such as the Joelette, the GRIT and the Freewheel
* A preliminary set of target specifications has been developed
* A preliminary target market has been established as paraplegics who would like more independence than offered by the TrailRider when exploring urban, class one terrain

**Assessment of Overall Progress:**

* Most of the tasks that needs to be finished this week is finished, and the rest need minor revisions to finish and not critical for starting next week’s tasks.
* Some team members may do more task wrap up than others, but the team as a whole is on track to complete the project on time.

**Goals for Next Week**:

1. Conclude and document research on the current TrailRider design (complete ‘Investigation’ appendix)
2. Conclude and document research on other products on the market (complete ‘Literature Research’ appendix)
3. Begin generating concepts for each function that has been identified

**Action Items for Next Week**:

|  |  |  |
| --- | --- | --- |
| Name | Action(s) | Due Date(s) |
| Andrea | Revise needs assessment | 9/16 |
| Carson | Summarize current wheelchair specifications | 9/16 |
| Julia | Summarize BCMOS (Investigation Appendix) | 9/16 |
| Lukas | Summarize existing designs (Literature Appendix) | 9/16 |
| Ratthamnoon | Determine overall project scope | 9/16 |
| Stephen | Revise needs assessment | 9/16 |
| All | Function Decomposition | 9/16 |
| All | Concept generation process (C-sketch rounds, concept combination) | 9/20 |
| All | DFMEA 1 | 9/20 |

**MECH 328 Weekly Progress Report *Dates: September 16 - 22***

Group: 10 Project Title: TrailRider 5.0

**Last Week’s Goals**:

1. To complete research on the current Trail Rider for the ‘Investigation’ appendix.
2. To complete research on other market comparables for the ‘Literature Research’ appendix.
3. To begin concept generation for the key functions.

**Last Week’s Activities**:

|  |  |  |  |
| --- | --- | --- | --- |
| Name | Activities | Hours Worked | |
| Last Week | Total |
| Andrea | * Generated concept fragments and full concepts * Analyzed the current design hands-on with team * Resumed Investigation Appendix & Final Report format | 8 | 17 |
| Carson | * Generated concept fragments and full concepts * Analyzed the current design hands-on with team * Organized generated concepts * Worked on the ‘Investigation’ Appendix | 8 | 18 |
| Julia | * Generated concept fragments and full concepts * Analyzed the current design hands-on with team * Updated Gantt Chart, created Risk Register, began Failure Appendix. | 8 | 10 |
| Lukas | * Generated concept fragments and full concepts * Analyzed the current design hands-on with team * Completed the weekly report * Completed the ‘Literature Research’ appendix | 8 | 17 |
| Ratthamnoon | * Generated concept fragments and full concepts * Analyzed the current design hands-on with team * Led weekly TA meeting * Updated target specifications for this week * Winnowing | 8 | 17 |
| Stephen | * Generated concept fragments and full concepts * Analyzed the current design hands-on with team * Worked on the value proposition * Winnowing | 8 | 17 |

**Summary of progress**:

* Market comparable research has been completed, and a more in-depth understanding of the current Trail Rider has been developed.
* Target specifications have been updated to more accurately represent the current stage.
* Concept fragments were generated for each of the prime functions, and full concepts were generated based on these fragments.
* Investigation appendix is partially complete.
* The project scope was determined and detailed along with an updated target market.
* Winnowing was completed.

**Assessment of Overall Progress:**

* Progress is in line with our Gantt chart projection and progress is sufficient to reach upcoming deadlines.

**Goals for Next Week**:

1. Score full concepts and complete DFMEA
2. Complete the ‘Investigation’ appendix

**Action Items for Next Week**:

|  |  |  |
| --- | --- | --- |
| Name | Action(s) | Due Date(s) |
| All | Score concepts that passed winnowing | 9/22 |
| All | Complete DFMEA 1 | 9/22 |

**MECH 328 Weekly Progress Report *Dates: September 23 - 29***

Group: 10 Project Title: TrailRider 5.0

**Last Week’s Goals**:

1. Score full concepts and complete DFMEA
2. Complete the ‘Investigation’ appendix

**Last Week’s Activities**:

|  |  |  |  |
| --- | --- | --- | --- |
| Name | Activities | Hours Worked | |
| Last Week | Total |
| Andrea | * Generated and discussed full concepts with team * Complete Investigation Appendix * Completed weekly report | 8 | 25 |
| Carson | * Discussed full concepts with the team * Researched existing patents related to lever-drive wheelchairs * Created a new requirements document * Developed evaluation criteria for WDM | 8 | 25 |
| Julia | * Discussed full concepts with team * Researched existing patents for lever propulsion * Re-drew and solidified full concepts in greater detail to prepare for WDM next week | 8 | 25 |
| Lukas | * Discussed full concepts with team * Re-drew and solidified full concepts in greater detail to prepare for WDM next week * Developed evaluation criteria for WDM | 8 | 25 |
| Ratthamnoon | * Discussed full concepts with team * Worked on and finished evaluation criteria | 8 | 25 |
| Stephen | * Researched rider guild to prove there is a market for a version of the TrailRider with more rider independence. * Discussed full concepts with team. | 8 | 25 |

**Summary of progress**:

* A new round of full concept generation was done, as per Professor Hodgson’s recommendation
* Four full concepts, of broad variety, were completed and are to be evaluated in the WDM
* Further research and decisions were made for setting up the ranking system of our WDM
* Further research was done to support our scope and the ranking of our needs
* Investigation Appendix was completed
* An updated requirements document was made in accordance to Professor Mckesson’s lecture

**Assessment of Overall Progress:**

* Progress is about a week behind Gantt chart schedule due to problems that arose in full concept generation and in developing a rating system for the WDM
* Optimization and DFMEA were also unable to be completed
* Scoring WDM has been pushed for next week, which is expected to take one day
* Optimization will commence after the WDM, which is expected to take the rest of the week
* DFMEA can take one day, as opposed to three days stated in the Gantt chart for lag time
* If the above assessment is correct, the team can be back on track and be ready for the Concept Selection Review

**Goals for Next Week**:

1. Complete scoring of our four full concepts in the WDM
2. Optimization and DFMEA
3. Be ready for CSR

**Action Items for Next Week**:

|  |  |  |
| --- | --- | --- |
| Name | Action(s) | Due Date(s) |
| All | Score full concepts in WDM | 10/06 |
| All | Optimize selected concept | 10/06 |
| All | Organize documents for CSR | 10/06 |

**MECH 328 Weekly Progress Report *Dates: Sept 29 - Oct 6***

Group: 10 Project Title: TrailRider 5.0

**Last Week’s Goals**:

1. Complete scoring of our four full concepts in the WDM
2. Optimization and DFMEA
3. Be ready for CSR

**Last Week’s Activities**:

|  |  |  |  |
| --- | --- | --- | --- |
| Name | Activities | Hours Worked | |
| Last Week | Total |
| Andrea | * Updated and organized concept drawings * Updated needs & stakeholders * Research on hand pedals, lever, manual wheelchairs for WDM | 8 | 33 |
| Carson | * Developed evaluation criteria for the WDM * Summarized work in a word document to justify criteria and weight choices | 8 | 33 |
| Julia | * Researched patents and efficiencies on the different propulsion types * Drew up the full concepts * Typed up full descriptions of concepts | 8 | 33 |
| Lukas | * Updated the target market and project scope document * Updated the target specifications, ranking, and WDM documents to be consistent and compatible for concept selection review | 8 | 33 |
| Ratthamnoon | * Researched patents for different types of wheelchair propulsion, and wrote documentation of relevant patents * Typed up full descriptions of concepts | 8 | 33 |
| Stephen | * Researched patents for lever driven wheelchairs * Made flowchart for concept selection review * Completed weekly report | 8 | 33 |

**Summary of progress**:

* Evaluation criteria for the WDM are updated and completed with justifications for criteria and weighting
* Found several patents for lever driven wheelchairs
* Concept drawings are updated and organized
* Efficiencies of different propulsion types researched
* Made a flowchart for concept selection review

**Assessment of Overall Progress:**

* Optimization and DFMEA were also unable to be completed
* Scoring WDM has been pushed for next week, which is expected to take one day
* Optimization will commence after the WDM, which is expected to take the rest of the week
* DFMEA can take one day once we have a full concept
* If the above assessment is correct, the team can be back on track and ready for the Concept Selection Review
* Last week’s goals have been bumped to next week

**Goals for Next Week**:

1. Complete scoring of our four full concepts in the WDM
2. Optimization and DFMEA
3. Be ready for CSR

**Action Items for Next Week**:

|  |  |  |
| --- | --- | --- |
| Name | Action(s) | Due Date(s) |
| All | Score full concepts in WDM | 10/06 |
| All | Optimize selected concept | 10/06 |
| All | Prepare for concept selection review | 10/06 |

**MECH 328 Weekly Progress Report *Dates: October 6 - 20***

Group: 10 Project Title: TrailRider 5.0

**Last Week’s Goals**:

1. Complete scoring of our four full concepts in the WDM
2. CSR Presentation
3. Begin Optimization and DFMEA 1

**Last Week’s Activities**:

|  |  |  |  |
| --- | --- | --- | --- |
| Name | Activities | Hours Worked | |
| Last Week | Total |
| Andrea | * Presented ‘Project Management’ during CSR * Organized/labelled concepts for presenting * Started DFMEA | 8 | 41 |
| Carson | * Completed WDM evaluation * Presented ‘Concept Evaluation’ during CSR * Began detailed design by laying out important trade-offs | 8 | 41 |
| Julia | * Drew concept B.2 in full detail for CSR * Presented ‘Concept Generation’ during CSR * Began sourcing major components for device | 8 | 41 |
| Lukas | * Completed WDM evaluation * Presented ‘Project Scope and Target Specs’ during CSR | 8 | 41 |
| Ratthamnoon | * Wrote full concept descriptions for CSR * Presented ‘Project Needs’ during CSR * Began detail design and optimization by researching appropriate methods | 8 | 41 |
| Stephen | * Presented ‘Function Decomposition’ during CSR * Started on DFMEA | 8 | 41 |

**Summary of progress**:

* WDM evaluations are complete and concept B.1 was selected to proceed
* All CSR material prepared and team presented successfully at CSR
* Began DFMEA 1
* Began researching design considerations for upcoming analysis and calculations
* Began general SOLIDWORKS model of general components (i.e frame)

**Assessment of Overall Progress:**

* Meetings have been cut by 2 hours this week, since we worked overtime up until now.
* DFMEA 1 will be finished next week
* Calculations and stress analysis will occur simultaneously while outsourcing components
* We are slightly behind schedule if we want to meet our “mock report” deadline. We are considering meeting up next Friday to make up for necessary work. However, we are on track for the actual report deadline.
* General CAD of Trailrider will be an ongoing project until 08/11/19

**Goals for Next Week**:

1. Determine governing equations for analysis of components to be input to MATLAB
2. Create excel sheet with a range of outsourced components including costs
3. Begin MATLAB optimization of the selected range of key components
4. Finish DFMEA 1 and begin DFMEA 2

**Action Items for Next Week**:

|  |  |  |
| --- | --- | --- |
| Name | Action(s) | Due Date(s) |
| Carson, Julia | Determine key equations for analysis of key component candidates | 10/21 |
| All | Outsource list of key components from McMaster (or similar) for further evaluation/selection | 10/25 |
| Friend | Perform optimization on MATLAB to determine final outsourced components | 10/28 |
| Stephen, Andrea | Complete DFMEA 1 and begin DFMEA 2 | 10/23 |

**MECH 328 Weekly Progress Report *Dates: October 20 - 27***

Group: 10 Project Title: TrailRider 5.0

**Last Week’s Goals**:

1. Determine governing equations for analysis of components to be input to MATLAB
2. Create an excel sheet with a range of outsourced components including costs
3. Begin MATLAB optimization of the selected range of key components
4. Finish DFMEA 1 and begin DFMEA 2

**Last Week’s Activities**:

|  |  |  |  |
| --- | --- | --- | --- |
| Name | Activities | Hours Worked | |
| Last Week | Total |
| Andrea | * Started DFMEA 2 * Started template for prototype appendix | 8 | 49 |
| Carson | * Developed Gantt chart for detailed design * Wrote weekly report | 8 | 49 |
| Julia | * Justified choice of chain drive over other drives * Refined Gantt Chart tasks for design stage | 8 | 49 |
| Lukas | * Started the needs and target specifications section of the final report. | 8 | 49 |
| Ratthamnoon | * Started general CAD assembly of the wheelchair * Started engineering calculations | 8 | 49 |
| Stephen | * Completed DFMEA 1 * Started on DFMEA 2 | 8 | 49 |

**Summary of progress**:

* A MATLAB simulation to choose a drive-system may be outside our scope given the remaining project time, so this task was removed from our plan
* The required appendices from the report rubric have been divided among team members
* DMFEA 1 was completed and DMFEA 2 has begun
* Chose the important design decisions that will be made in the detailed design phase
* Preliminary SolidWorks model has been completed, it will be updated as detailed design is continued

**Assessment of Overall Progress:**

* Our team has approximately 10 meetings before the report is due. Our design decisions moving forward will be greatly constrained by time. The majority of our efforts will be put into designing a drive-system, while other components such as frame material, fasteners and seat cushion will be chosen such that they are ‘good enough for a prototype’.
* Three appendices of the report have been written, and the largest remaining appendices have been assigned ‘leaders’ who will ensure that all rubric items are met.
* All decisions leading up to the CSR are considered finalized, which means that Appendix D and Appendix E can be written.

**Goals for Next Week**:

1. Choose a train value with justification and calculations
2. Choose all components for the drive system
3. Choose wheels and a caster
4. Complete Appendix D
5. Make substantial progress on Appendix E
6. Complete the second DFMEA

**Action Items for Next Week**:

|  |  |  |
| --- | --- | --- |
| Name | Action(s) | Due Date(s) |
| Carson | Choose a train value with justification | 10/30 |
| Julia | Choose the type of power transmission with justification | 10/30 |
| Friend | Choose wheels and a caster with justification | 10/28 |
| Stephen | Complete DFMEA 2 | 10/28 |
| Stephen | Lay out the foundation for Appendix H: Failure and Safety | 11/01 |
| Lukas | Complete Appendix D: Needs, Requirements and Evaluation Criteria | 11/01 |
| Lukas | Lay out the foundation for Appendix E: Concept Development and Selection | 11/04 |
| Andrea | Lay out the foundation for Appendix J: Prototype Testing | 11/01 |

**MECH 328 Weekly Progress Report *Dates: Oct 28 - Nov 3***

Group: 10 Project Title: TrailRider 5.0

**Last Week’s Goals**:

1. Choose a gear train value with justification and calculations
2. Choose all components for the drive system
3. Choose wheels and a caster
4. Complete Appendix D
5. Make substantial progress on Appendix E
6. Complete the second DFMEA

**Last Week’s Activities**:

|  |  |  |  |
| --- | --- | --- | --- |
| Name | Activities | Hours Worked | |
| Last Week | Total |
| Andrea | * Worked on the life cycle analysis appendix | 8 | 57 |
| Carson | * Determined preliminary train value range * Specified chair width per engineering calculations | 8 | 57 |
| Julia | * Researched various bike components to explore synergies and compatibility issues. | 8 | 57 |
| Lukas | * Completed a draft of 50% of the report body. * Wrote this weekly report. | 8 | 57 |
| Ratthamnoon | * Completed preliminary engineering design calculations to address prime areas of concern | 8 | 57 |
| Stephen | * Finished DFMEA 2 * Made significant progress towards DFMEA 3 | 8 | 57 |

**Summary of progress**:

* A preliminary gear ratio range has been determined to provide a general value such as to enable the specification of other drivetrain components.
* The second DFMEA is complete, and the third is nearing completion with only minor further revisions required per final design information.
* Life cycle analysis is 50% complete.
* Significant progress was made on the report in lieu of Appendices D and E.

**Assessment of Overall Progress:**

* Our team has approximately 7 meetings before the report is due. Our design decisions moving forward will be greatly constrained by time. The majority of our efforts will be put into designing a drive-system, while other components such as frame material, fasteners and seat cushion will be chosen as prototype quality.
* Appendices of the report are in various stages of completion and have been assigned ‘leaders’ who have begun their respective sections to ensure rubric deliverables are met.
* Drivetrain component selection is proving to be more time consuming than we initially anticipated. As such, we plan to focus on aspects relevant to propulsion and potentially abandon the specification of parts that at not unique to our design such as disc brakes.
* A MATLAB optimization has been removed from our plan based on time constraints as our time is better spent on ensuring we have a working set of components. Detailed optimization can be completed at later stages that are out of the scope of this project.

**Goals for Next Week**:

1. Finalize the specification of all drivetrain components.
2. Develop a working draft for all appendices to better evaluate progress.
3. Complete the third DFMEA
4. Complete all minor appendices

**Action Items for Next Week**:

|  |  |  |
| --- | --- | --- |
| Name | Action(s) | Due Date(s) |
| Carson | Finalize part specifications; intent towards producing a detailed list of components and associated costs. | 11/06 |
| Julia | Complete assigned minor appendices. | 11/01 |
| Friend | Refine calculations per final part specifications.  Assemble the CAD model of the drivetrain system; intent to deliver engineering drawings and report images. | 11/06 |
| Stephen | Complete the failure modes appendix and assists with finalizing part specifications. | 11/06 |
| Lukas | Continue assigned in progress sections of the report body. | 11/01 |
| Lukas | Complete Appendices D and E | 11/04 |
| Andrea | Complete the life cycle analysis appendix and other minor appendices as per Goal item 4 for next week. | 11/06 |

**MECH 328 Weekly Progress Report *Dates: November 3 - 10***

Group:10 Project Title: TrailRider 5.0

**Last Week’s Goals**:

1. Finalize the specification of all drivetrain components.
2. Develop a working draft for all appendices to better evaluate progress.
3. Complete the third DFMEA
4. Complete all minor appendices

**Last Week’s Activities**:

|  |  |  |  |
| --- | --- | --- | --- |
| Name | Activities | Hours Worked | |
| Last Week | Total |
| Andrea | * Specified parts for drive train * LCA and Prototype testing continued | 8 | 65 |
| Carson | * Completed draft of Appendix F | 8 | 65 |
| Julia | * Completed project management and weekly report appendices * Searched for drive train parts and compatibilities | 8 | 65 |
| Lukas | * Completed draft of report summary | 8 | 65 |
| Ratthamnoon | * Simplified drive system design to speed up parts specification process * Finished chain failure calculations from DFMEA, and assist with other calculations * Specify overall dimensions, and start assembling drive train in SolidWorks | 8 | 65 |
| Stephen | * Completed DFMEA 3 * Specified parts for drive train | 8 | 65 |

**Summary of progress**:

* Specification of drive system parts is done with the help of design simplification, and blackboxing parts that are time-consuming but not as critical to the drive system as a whole.
* Most of written appendices are split up between members and expected to be done before the meeting next week. However, there are some appendices that are contingent on other appendices that were just finished (ex: engineering drawing appendices needs parts specification, which was just done because calculations were just done), so those will be written next week.

**Assessment of Overall Progress:**

* Some parts of the report may be more polished than others due to more time available, but all appendices will be written.
* Group is on track to finish the report without overtime.

**Goals for Next Week**:

1. Finish any appendices that leftover.
2. Assemble all of the appendices into a coherent report, and proofreading.

**Action Items for Next Week**:

|  |  |  |
| --- | --- | --- |
| Name | Action(s) | Due Date(s) |
| Carson | Finalize Appendix F; edit other sections of the report | 11/13 |
| Julia | Complete cost of goods and user manual appendices | 11/13 |
| Friend | Assemble the CAD model of the drivetrain system; deliver engineering drawings and report images. | 11/13 |
| Stephen | Complete appendices H and E | 11/13 |
| Lukas | Refine and edit report content | 11/13 |
| Andrea | Complete appendices I and J | 11/13 |
| All | Compile appendices into report | 11/15 |