NOTE – This template applies ONLY to the Mini-Project Final Technical Memo!

Be sure to remove all of these notes / guidelines before you submit your memo!

# **Mini-Project Final Technical Memo**

Team member 1, Team member 2

**IED Section**: [Insert your section number]

**Date**: [Insert the date of the memo]

**General Notes / Instructions**

The purpose of the mini-project final technical memo is to clearly explain your concept generation and selection process and how well your device performed as demonstrated through your testing so that the reader (e.g. your instructor):

* can understand the concepts you considered
* can understand and follow your concept selection process
* can confirm that you understand the problem
* can clearly understand your solution approach

**Guidelines for this Mini-Project Final Technical** **Memo**

1. DO use this template!
2. There is NO separate cover page for a memo
3. There is NO Table of Contents for a memo
4. There are NO appendices for a memo
5. The memo should be 5-10 pages long NOT counting figures, illustrations, photos, diagrams, reference list
6. DO use in-line citations in the body of the memo. Let Word's automation help you! There is a video on LMS on how to do this.
7. DO use headings and sub headings to help organize your paper
8. DO create sketches to illustrate your proposed solution. Hand drawn sketches may be scanned and inserted into the memo. Be sure these are neatly drawn & labeled and clearly scanned for readability. CAD (mechanical or electrical) may be used but is not required.
9. DO use the technical writing style
10. You do NOT need to explain in this memo how or why you selected this project from the various alternatives.
11. DO place drawings, figures, tables, sketches, diagrams, graphs, etc. in the body of the memo. Label them and be sure to reference / describe them in the text.
12. DO submit this as a SINGLE file. Embed your Gantt Chart and all scanned images into the document. Do NOT submit these as separate files! If you need help with this - ask!
13. DO remember to remove all template notes & instructions before you turn in your memo!

# Introduction

TO DO - Clearly identify the problem you are attempting to solve. Identify the expected benefits from your proposed approach / solution.

# Concepts and Benchmarking

TO DO: Investigate and document existing products and technology that are related to and/or similar to what you are proposing. DO identify at least 3 concepts and include a sketch of each. Hand drawn sketches, cleanly drawn and legibly scanned are acceptable – CAD is not required. Be sure to explain and make reference to figures these in your text.

Include your mind maps, concept selection matrix and/or concept combination tables to show how you decided what approach to follow. Your goal is to demonstrate to the reader that you followed the design process in selecting your approach.

Table : Concept Selection Matrix



NOTE: The above example table (implemented as an embedded Excel spreadsheet) should be replaced with your matrix showing the various solution approaches you considered before down selecting to your proposed solution. You may also include mind maps or a concept combination table as seen in Table 3: Concept Combination Table. Be sure to explain these in your text.

Table : Concept Combination Table

|  |  |  |
| --- | --- | --- |
| **Machine to Modify** | **Method to Generate Power** | **Use Power to …** |
| Bike | Mechanical - axle to series of gears to drive a separate alternator | Run a fan |
| Treadmill | Alternator - replace fan/wheel with rotor magnet assembly | Charge car battery |
| Erg | Alternator - attach rotor magnets to original fan/wheel | Music player |
| Stepper | Regenerative braking | Charge other electronics/batteries |
| Elliptical |  | Pump water |
| Weights |  | Power treadmill |

# Solution

TO DO: Describe the solution you chose based on your concepts and selection method. Include photos and/or sketches of your device’s final design. Hand drawn sketches, cleanly drawn and legibly scanned are acceptable – CAD is not required. Be sure to explain and make reference to figures these in your text.

# Test Plan and Test Results

TO DO: Include a description of your test plan, e.g. how did you test your device to ensure that it met the project requirements. Include tables of the raw data you collected and graphs that help show any trends or relationships within the data. For the launcher and mousetrap cars, be sure to follow the approach described in the scoring spreadsheet to collect accuracy and precision data. For each of your trials, calculate the overall X and Y centroids and then calculate the precision and accuracy for each run. Be sure your graphs / charts show how your accuracy & precision varied as you made design changes to your device.

For the line follower, analyze the time data and the number of times your vehicle left the course. Be sure your graphs / charts show how these two items varied as you made design changes to your device.

# Conclusion

TO DO: Provide a summary of the technical aspects of your work including your design process in terms of concept generation and selection and your fabrication work. Include an objective evaluation of your device’s actual performance based on testing and observation.

# Lessons Learned

TO DO: Provide a summary of what each of you learned from working as part of a team. Focus on the non-technical aspects such as time management and communications.

# References

NOTES: DO take advantage of Word's built in citation tool. If you use this tool as you make your in-line citations, Word can generate that list here automatically for you. The two items below are simply an example.

Dell's Wireless Charging Laptop. <http://www.pcmag.com/article2/0,2817,2353745,00.asp>.

Solar Power Charging Station. 2011 <http://www.alibaba.com/product-gs/410896584/14\_5Wportable\_PU\_leather\_Solar\_Power.html>.