***Collegiate Design Report Template***

*Instructions:*

1. *Use this template to write your Design report following the guideliness provided in the STEM rubric.*
2. *Italized text is for reference/direction and should be deleted before submission*
3. *This page should be deleted be deleted before submission*

*Reminders:*

* *Do not exceed 4,000 words*
* *Use pictures, diagrams, charts, graphs, and images throughout the report in support of, or to substitute text to more effectively and efficiently convey information to the reader. Make sure their placement is logical, their purpose is clear, and they are easy and intuitive to interpret and understand.*

*Title Page*

**Design Report**

**School Name:** *[school name]*

**Team Name:** *[team name]*

**Kart Number:** *[kart number]*

**Date:** *[date written]*

**Written by:** *[names of students that contributed to the content]*

**Word Count:** *[word count]*

**Introduction:**

*[The introduction should draw in the reader, highlight what will be discussed in the report, and excite the reader to read the report.]*

**Battery and Battery Management System:**

**Requirements:**

*[Describe the desired improvement you were trying to achieve and why it will produce better performance]*

**Research & Predictions:**

*[Describe the variables/design options that could create the desired improvement and calculate/estimate the expected impact they will have. Explain how you used this information to inform your design.]*

**Design:**

*[Show and explain your design in such a way that it is intuitive to the reader how this design satisfies the defined requirements. Use labels to highlight key features and functions.]*

**Build:**

*[Include pictures of the actual components and/or sub-system(s). Include labels to highlight key features and make it easy for the reader to correlate the finished product to the intended design]*

**Test:**

*[Design a credible experiment that isolates the tested variables as much as possible and has an accurate measurement system. Run the experiment, record the data, analyze, and interpret the results, and describe how the result compared to your expected and desired outcome.]*

**Correlation/Integration:**

*[Continue testing and iterating design variables until your calculated predicted performance aligns closely with actual test results.]*

**Results:**

*[Summarize final achieved results in terms of sub-system and kart performance. Compare those results versus predicted results and explain the difference. Provide logical future improvement ideas to reduce/eliminate the difference and/or further enhance performance.]*

**Motor and Motor Controller:**

**Requirements:**

*[Describe the desired improvement you were trying to achieve and why it will produce better performance]*

**Research & Predictions:**

*[Describe the variables/design options that could create the desired improvement and calculate/estimate the expected impact they will have. Explain how you used this information to inform your design.]*

**Design:**

*[Show and explain your design in such a way that it is intuitive to the reader how this design satisfies the defined requirements. Use labels to highlight key features and functions.]*

**Build:**

*[Include pictures of the actual components and/or sub-system(s). Include labels to highlight key features and make it easy for the reader to correlate the finished product to the intended design]*

**Test:**

*[Design a credible experiment that isolates the tested variables as much as possible and has an accurate measurement system. Run the experiment, record the data, analyze, and interpret the results, and describe how the result compared to your expected and desired outcome.]*

**Correlation/Integration:**

*[Continue testing and iterating design variables until your calculated predicted performance aligns closely with actual test results.]*

**Results:**

*[Summarize final achieved results in terms of sub-system and kart performance. Compare those results versus predicted results and explain the difference. Provide logical future improvement ideas to reduce/eliminate the difference and/or further enhance performance.]*

**Powertrain Integration:**

**Requirements:**

*[Describe the desired improvement you were trying to achieve and why it will produce better performance]*

**Research & Predictions:**

*[Describe the variables/design options that could create the desired improvement and calculate/estimate the expected impact they will have. Explain how you used this information to inform your design.]*

**Design:**

*[Show and explain your design in such a way that it is intuitive to the reader how this design satisfies the defined requirements. Use labels to highlight key features and functions.]*

**Build:**

*[Include pictures of the actual components and/or sub-system(s). Include labels to highlight key features and make it easy for the reader to correlate the finished product to the intended design]*

**Test:**

*[Design a credible experiment that isolates the tested variables as much as possible and has an accurate measurement system. Run the experiment, record the data, analyze, and interpret the results, and describe how the result compared to your expected and desired outcome.]*

**Correlation/Integration:**

*[Continue testing and iterating design variables until your calculated predicted performance aligns closely with actual test results.]*

**Results:**

*[Summarize final achieved results in terms of sub-system and kart performance. Compare those results versus predicted results and explain the difference. Provide logical future improvement ideas to reduce/eliminate the difference and/or further enhance performance.]*

**Mechanical Systems Design & Kart Tuning:**

**Requirements:**

*[Describe the desired improvement you were trying to achieve and why it will produce better performance]*

**Research & Predictions:**

*[Describe the variables/design options that could create the desired improvement and calculate/estimate the expected impact they will have. Explain how you used this information to inform your design.]*

**Design:**

*[Show and explain your design in such a way that it is intuitive to the reader how this design satisfies the defined requirements. Use labels to highlight key features and functions.]*

**Build:**

*[Include pictures of the actual components and/or sub-system(s). Include labels to highlight key features and make it easy for the reader to correlate the finished product to the intended design]*

**Test:**

*[Design a credible experiment that isolates the tested variables as much as possible and has an accurate measurement system. Run the experiment, record the data, analyze, and interpret the results, and describe how the result compared to your expected and desired outcome.]*

**Correlation/Integration:**

*[Continue testing and iterating design variables until your calculated predicted performance aligns closely with actual test results.]*

**Results:**

*[Summarize final achieved results in terms of sub-system and kart performance. Compare those results versus predicted results and explain the difference. Provide logical future improvement ideas to reduce/eliminate the difference and/or further enhance performance.]*

**Conclusion:**

*[Summarize the most important take-aways and leave the reader energized to share the report with others.]*