**Design of Engineering Systems Project Report**

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| **Title** |  |
| **Author Names** |  |
| **Submission Date** |  |

**Summary (5 points)**

* Describe what this product does- aim this description at the end user.
* Provide background information assuming the user does not know the context this product is used in.
* Describe briefly all inputs and outputs that are relevant to the end user (not a technical description)

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**Instructions**

Submit this report to the appropriate folder on D2L site in Microsoft Word format. The report should be in Times New Roman or Arial font, no smaller than 10 point and double spaced.

Note that all reports are scored on a 100 point scale. If the report is worth more or less than 100 points the score will be normalized to the points for the course

**DO NOT REMOVE TEXT OR BULLETS FROM UNDER SECTION HEADINGS!**

**Description (10 points)**

* Describe what this product does for a technical user short on time (be brief).
* Write a bulleted list of the products features
* Provide enough background information to put the project in a technical context.
* Describe briefly inputs and outputs of the product (a technical description but not tables of data).
* Provide a level 0 functional block diagram. This block diagram should be a physical layout of the product showing the physical location of connections to the device.

**Product Block Diagram and pin out diagram (10 points)**

* On one sheet of paper provide a level 1 functional block diagram of your product.
* On a separate sheet of paper provide a diagram of the inputs and outputs for the level 1 block diagram as a system. If you are doing a project that has a significant high-level (e.g. C or C++) software component, include a table of public functions.
  + ONLY INCLUDE INPUTS AND OUTPUTS OF THE SYSTEM FROM THE LEVEL 1 BLOCK DIAGRAM.
  + DO NOT INCLUDE INTERNAL CONNECTIONS/FUNCTIONS THAT ARE NOT ACCESSIBLE TO THE USER.
  + If your device has visual/tactile/audible user interfaces (such as displays, sounds, buttons) include these in the table.
  + Make sure you include detailed diagrams of any connectors with pin numbers.
  + The pin numbers and connector designations should match the Reference Designators from your layout and also the terminology used in your level 1 block diagram.

NOTE: No text on any drawing or schematic can be less than 10 point font, and the minimum component dimension on any drawing is ¼” (6 mm). Your block diagram must identify each part of your system and who was responsible for that part. Your block diagram may be on a separate page if required. If needed you are encouraged to insert a page larger than the standard letter size. To do this: 1) *Insert* → *Break* → *Page Break*. 2) *File* → *Page Setup*. In the dialog box select the *Paper* tab and set the size to custom. Then select *From this point forward*, from the *Apply to:* pull-down menu. 3) Select the paper size you need for your drawing. Sizes up to 22”×22” are supported. 4) Insert another page break. Follow the instructions in step 2 to set the rest of the document back to letter size (from the new page break forward)

**Detailed Technical Description (15 points)**

* Describe the principles of operation of your device in detail.
* Provide a brief description of the signals/data at all inputs, outputs and internal test points.
* Describe the test procedures used to verify proper device operation.
* Provide a brief description of debugging techniques and common problems the user might encounter with your device.

**Tables of Detailed Technical Specifications Explaining your Design (15 points)**

Describe the models, drawing, simulations, etc. that your team used to understand and make predictions about your design project. You should write one to three paragraphs on each of the points below:

* List in tables measured values of all input and output pins/calls to the device during normal operation.
* Provide graphs or figures of any:
  + Measured time dependent inputs, outputs, and signals at all test points. For high level software components describe data passed (i.e. between functions, databases, I/O devices, etc.) and provide examples of actual data.
  + Measured change in output with changing input parameters (i.e. variation of gain with operating voltage for an amplifier)
  + Considering all components used list the Absolute minimum and maximum operating ranges.

**Detailed Application Information (15 points)**

This section provides instructions to users on how to get your device working (in one or two paragraphs).

* Describe in detail how to use the device
* Describe in detail how to connect the device to other systems
* Describe common fault conditions and how to correct them
* Describe any variable voltages, resistances, currents, or any other user selectable hardware features
* Describe if necessary how to calibrate the device and or test for proper operation.
* Describe how to program any onboard memory or microprocessor

# Application Example (10 points)

* Describe in detail an example of how the device would be used by the end user.
* Provide a connection diagram specifying needed hardware, cables, power supplies, etc.

**Team Organization and Management (10 points)**

* State how your team was organized and what role each team member played. Describe the ground rules set up for meetings.
* Describe how your team determined whether work was performed to a professional standard and how the team addressed issues of individuals who did not meet expectations.
* Identify specific and practical suggested improvements in team organization and management.
* Identify any specific weaknesses of your approach/performance and how you would fix them.

**References (5 points)**

Use the IEEE Style. Details can be found on the course web site or in the IEEE Authors Manual. References must be cited in the body of the text.

**Appendix (5 points)**

* Provide any relevant diagrams, schematics, PCB Layouts, Code, or other technical documentation.