EECE 492 Final Submission Requirements

The following document outlines the required elements of your final hardware design submission for completing the requirements of EECE 492.

The following elements will be required to be submitted in ONE document (PDF or .doc/.docx). The resolution of all images must be sufficient to identify text and wire connections.

1. Title Page
   1. This page must include your most recent project name (if changes were made) along with a list of all members of your project group.
   2. If an external source was used to derive requirements for the project (such as a sponsor) then the name of the sponsor must also be included on the title page
   3. The current calendar year of your submission.

RUBRIC: points will be given for the correct inclusion of all applicable elements above.

1. System Design
   1. This page must include a one paragraph summary of your overall system design.
   2. You must also include an image of your general system architecture showing major components and connections/protocols. You may simply reuse the system-level design submitted for your project description in the Fall if no changes were made that need to be updated on the system-level diagram.

RUBRIC: points will be given based on the accuracy of the diagram and description above. Points will be deducted for grammatical errors in your writing and for technical inaccuracies in your writing and diagram. Points will be deducted for elements of your system-level diagram that are unclear or sloppy (no hand-drawn diagrams, no needlessly sloppy wiring or component orientations, etc.)

1. System Schematic
   1. This page(s) will be your EDA schematic (from Altium or an equivalent software). All elements of your board design must be reflected on the schematic (components should not have been generated in the board design without a corresponding schematic symbol in the schematic design).
   2. The schematic must have a properly filled out information box in the lower right corner which includes at a minimum the project name, sheet name, sheet number, engineer and/or draftsman name, date, and version number.

RUBRIC: Points will be deducted for lack of grid alignment, missing connections, improper annotation (not using IEEE standard annotation letterings, skipping annotation numbers), wires at angles other than perfectly horizontal or vertical, drastically different component styles, mislabeled components or signals, mis-wired components or pins, lack of overall visual clarity. As a test, imagine you sent your schematic and your bill of materials to another engineer with the same technical expertise as you. Would they be able to use those two documents to construct a PCB of your design? Would there be any information left out or ambiguous? If so, points will be deducted.

1. PCB Design
   1. These pages must include high-resolution images of your PCB design (top showing top copper prominent, and flipped view of the board showing bottom copper prominent).
   2. If you need to take screenshots to generate these images, multiple screenshots of your PCB while zoomed in are acceptable. This section of your submission can span multiple pages if necessary to get sufficient detail.

RUBRIC: your design must follow all standard PCB design rules and protocols. Points will be deducted for incorrect or missing wiring, insufficient considerations for power and signal distribution (power traces too small and routed over multiple vias, for instance), risking design decisions (wires running too close to the corner or edge of a pad unnecessarily, for instance), poor layout decisions, and slopping alignment of components.

1. Bill of Materials
   1. A spreadsheet listing every component added to your PCB. This list must only include components that must be physically purchased separately (a cut-trace component, for instance, would not be listed in a BOM as it only exists as a stand-alone PCB feature).
   2. Each listed item should include (at a minimum) footprint (if applicable), manufacturer (or “generic”), part number (if applicable), component value (if applicable for things like resistors and capacitors), associated designators (list all if multiple, for instance: “R1, R3, R5, R6” if all four of those resistors share the same resistor value and footprint)

RUBRIC: the best measure of success for this document is if another engineer reading it plus your schematic would be able to completely design a PCB and assemble that PCB for your circuit design using only those two documents. Any lack of information or ambiguity will result in point deductions.

1. Part Selection Mini-Report
   1. A short essay (less than one page) describing your research into a possible alternative part for your design. The essay should examine the pros and cons of this alternative part compared to your chosen component. The conclusion should be whether you evaluate the alternative part is a preferred replacement. The examination should consider public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors (more details in class discussion).
2. Assembly and Test Procedure
   1. Based on your schematic design, this page must detail the process and procedure by which an engineer would assemble (component placement order) the design and test the design in such a way that the proper operation of each major system component can be verified.
   2. This page must refer explicitly to component designators when describing the procedure, for instance:
      1. “Solder J1 and R1 and R2. Connect a USB cable to J1 and measure the voltage between TP5 and TP2 to verify it is 5V”

RUBRIC: as with the BOM and schematic, the test of success here is whether or not another engineer would be able to follow your procedure and adequately verify the design. Ambiguity or incorrect process/procedure or insufficient process/procedure to verity will result in deduction of points.

1. Final Status
   1. This page should communicate to me your final (end of quarter) status with regard to testing and verification. Include design images (photos) showing your soldering and list components verified, failures identified, and resolutions of those failures (both successful and pending board revision arrival. Points will be deduced for incomplete communication of status as well as excessive untested design changes.