EE 193 Design deliverables

Conceptual design

Your conceptual design should be a document which describes your design at a high level and answers the following questions:

- What sensor(s) will you use to measure temperature?
- What microprocessor will you use for the system? How will it relay data back to the server?
- How will the system be powered?

For each of the above, you should describe why you made the choice you did, particularly in comparison to some of the other alternatives.

Your conceptual design should include a section discussing the power requirements of your system:

- Estimate the power usage of your system, including time spent taking measurements, transmitting data, and asleep.
- What capacity battery do you need? How long will the system be able to run on a single battery charge?
- If you're using a solar panel or other energy harvesting system, how much power do you need to collect (i.e., what size solar panel do you need)?
- What power conversion circuitry will you need? You don't need to draw out the whole circuit (that's for next time!) but you should be clear about what the circuitry needs to do.

Preliminary design

Your preliminary design should be a collection of documents which describe your design in detail and are (almost) ready to be manufactured.

- Completed schematic, showing all parts of the system (sensor, processor, power/charging, debug, etc).
- Complete bill of materials. This should be a spreadsheet or table with the following:
    - Description of part (e.g., 10k resistor)
    - Digi-Key part number
    - Quantity needed **per sensor node**
    - Cost/each assuming you're building 1000 nodes. (E.g., if you need five 0.1uF capacitors for each board, quote the price for 1 capacitor at quantity 5000.)
- PCB layout

For Tuesday's class, you should prepare a brief presentation to explain your design the to class. You should have 3 slides:

- System overview (a block diagram showing the main components of your system and how they fit together)
- Schematic diagram (this can be two or more slides if it's too small to see on one slide)
- PCB layout

You should be ready to answer (and ask) questions like:

- Why did you choose the parts you did?
- What are the main design-for-X features of the design? (design for test, design for debug, design for manufacturing, etc)
- What parts of the design are you uncertain about? What parts do you feel are the most risky or likely to have problems?

Put your KiCAD design, slides, and any other resources in your team's Google Drive folder.