Senior Design Meeting Agenda ─ Microgrid Team

10:00AM Thursday, February 11th, 2021
205 Stinson Remick
Meeting Leader: *Kelsey*
Secretary: *Sylvia*

- Show system and subsystem design from last semester and discuss **(pages 2-6)**
- Go over the timeline for Design Reviews and clarify what is expected at each
  - Ask about what kind of "design" is expected for Design Review 1
    - Thinking that we should have the PCBs designed, specific components chosen, etc.
- Discuss plan to achieve Design Review 1 on the week of March 1st **(page 7)**

System and Subsystems
Block Diagrams and Subsystems' Requirements

Overall System:

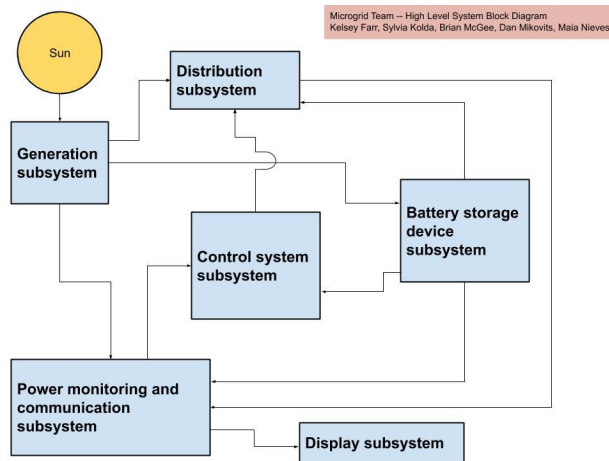The high level block diagram of the overall system is shown below in Figure 1.

Figure 1. High Level Block Diagram of Overall System

Subsystems:

- Generation
- Distribution
- Storage
- Control System
- Monitoring
- Display

Block diagrams for each individual subsystem are shown in Figure 2 through Figure 7.
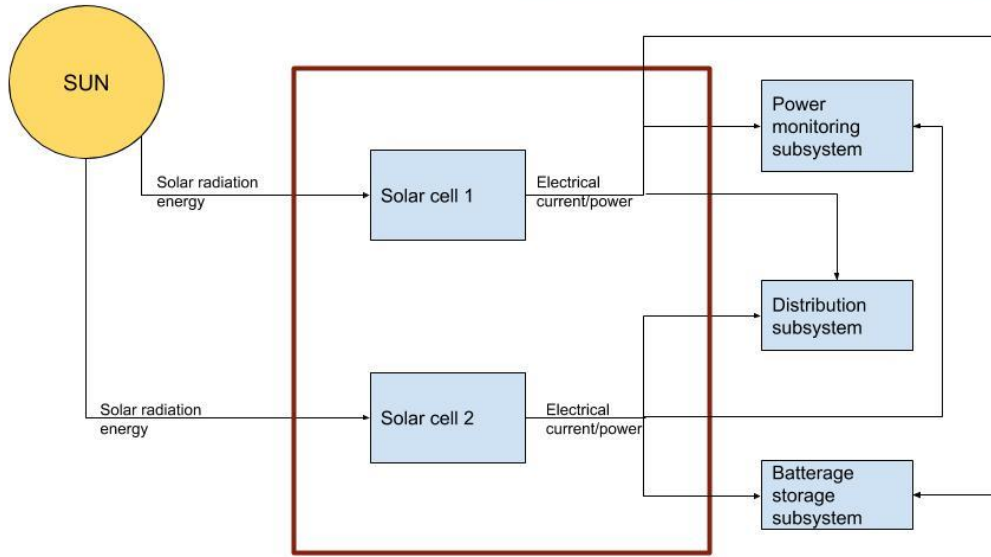
Figure 2. Block Diagram of Generation Subsystem

Figure 3. Block Diagram of Distribution Subsystem

Figure 4. Block Diagram of Battery Storage Subsystem

Figure 5. Block Diagram of Control System Subsystem

Microgrid Team -- Power Monitoring Subsystem Block Diagram
Kelsey Farr, Sylvia Kolda, Brian McGee, Dan Mikovits, Maia Nieves

Figure 6. Detailed Block Diagram of Power Monitoring Subsystem

Microgrid Team -- Display System Block Diagram
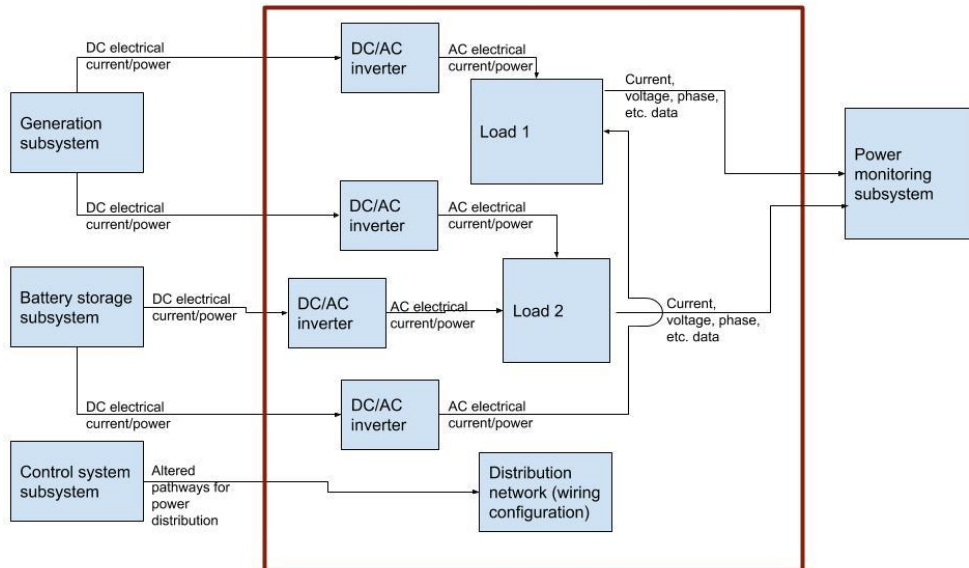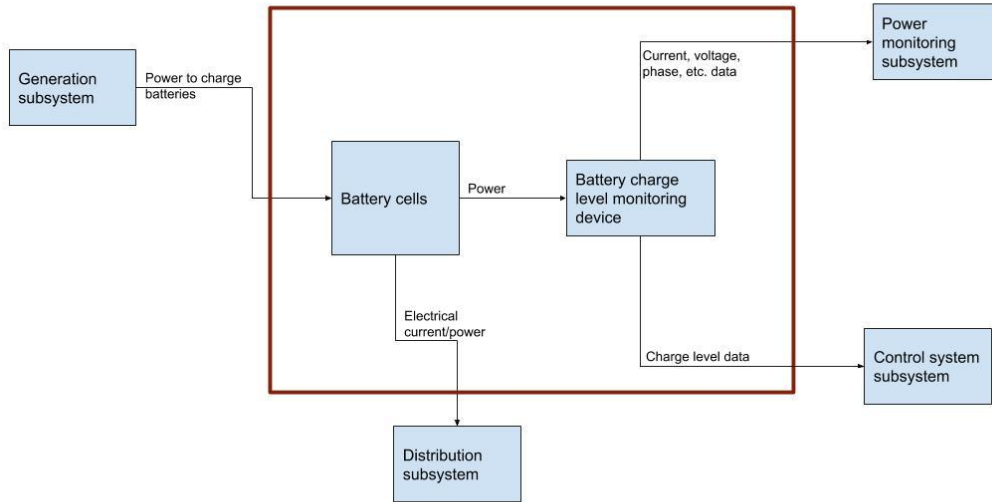Kelsey Farr, Sylvia Kolda, Brian McGee, Dan Mikovits, Maia Nieves

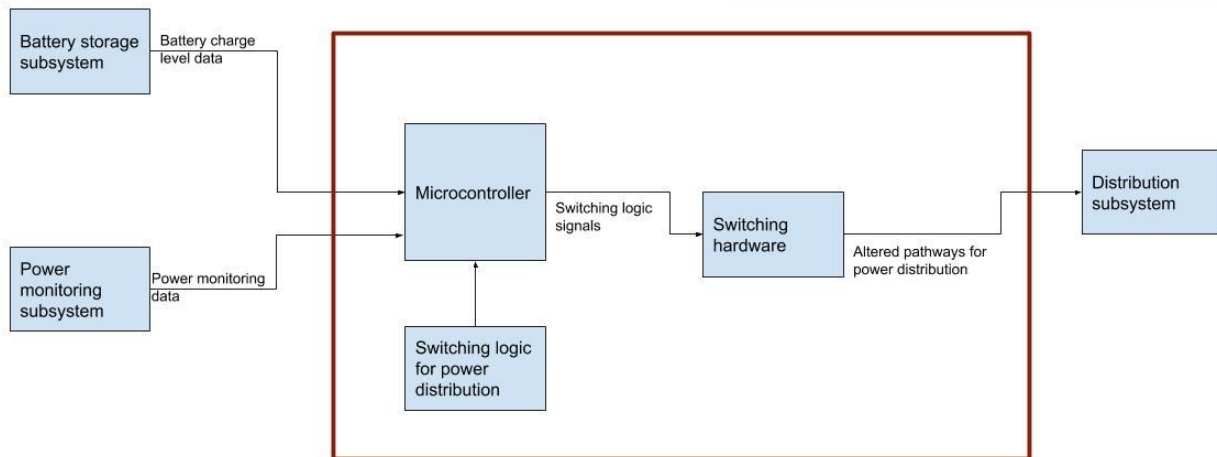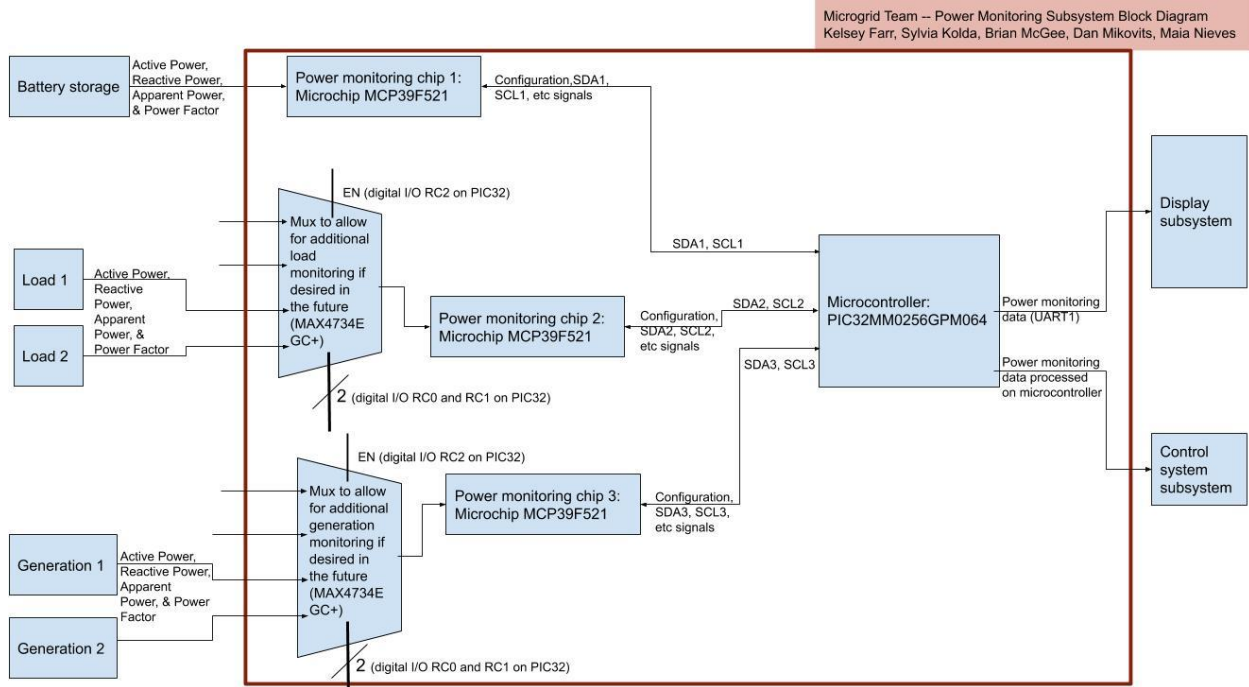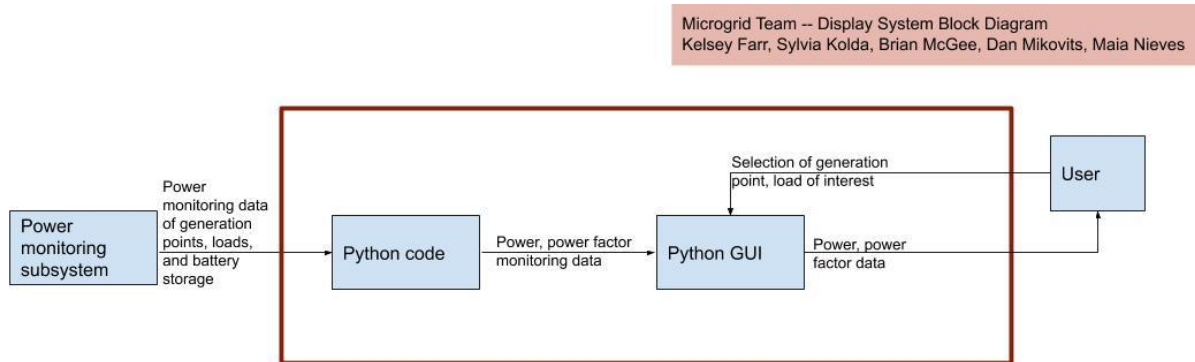**Figure 7.** Block Diagram of Display Subsystem

Subsystem and Interface Requirements:

- Generation Subsystem
  - Solar Panels
- Distribution Subsystem
  - Grid (distribution wires)
  - Inverters
  - Loads
- Storage Subsystem
  - Battery system
    - Batteries
    - Fuses
    - Battery charge level monitoring device
- Control Systems Subsystem
  - PCB
    - Outputs to switches
    - Multiplexer so that we can designate which switch we are talking to without multiple pins
    - Switches
- Monitoring Subsystem
  - PCB
    - Analog inputs
      - Multiplexer so that we can designate which switch we are talking to without multiple pins
    - I2C communication
- Display Subsystem
  - Python (or MATLAB?) GUI
    - Display power factor at each load
    - Demand at each load
    - Charge of battery
    - Percentage of current coming from generation vs storage
    - Curves at each load?

Plan to achieve Design Review 1 on the week of March 1st

- Meet as a group once-twice per week to check progress and discuss issues/questions → Tuesday 11:30AM, Thursday 3:45ish PM
  - Can be modified to meet the needs of the group and progress
- Each person is assigned one subsystem to design (adjust responsibilities as needed)
  - Choose components
  - Detailed block diagram
    - With signal types (I2C, etc.), number of signal lines needed, etc.
  - Eagle schematic

  - **Generation** - *Sylvia*
  - **Distribution** - *Dan*
  - **Storage** - *Brian*
  - **Control System** - *Kelsey*
  - **Display** - *Maia*
  - **Monitoring** -- Done last semester

- Preliminary plan for Design Review 2 on the week of March 22nd (physical build)
  - General groups
    - Load/generation systems (1 person)
    - Battery system (1 person)
    - Control system (3 people -- 1 main, 2 pivot?)
      - GUI Design