

**Group number: May1727-28**

**Project title:**

**Client &/Advisor: Dr. Ajarapu**

**Team Members/Role:**

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Nathaniel Byrne, Group Leader
Mike Trischan- Key Concept holder
Matthew Lee & Communications Lead
Jeffrey Szostak, Tech Lead
Brian Gronseth Tech Lead
Eric Cole Webmaster

○ **Weekly Summary (Short summary about what you did this week)**

We are working on completing our simulations of our solar and wind systems. It is necessary to have functioning models of these systems before we can progress. More importantly we need to understand everything about these models and why before we can transition to hardware. That way we can build better test setups and avoid breaking parts or wasting money when it comes to hardware. Advisor has not been present at last two weekly meetings but the TA is doing a great job of working with us and helping us get work done.

○ **Past week accomplishments (please describe as what was done, by whom, when)**

Matt was doing his things again by continuing to situate these group reports. Solar team is on track and is close to being able to work with the hardware hands on. Wind team making good progress, still has some few things to do along with situating more information regarding the new wind turbine emplacement.
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Researched different turbines that we could purchase to use for this project. Created a spread sheet comparing specs of different turbines. Contacted different vendors to ask questions to learn more about there products. Contacted Nick David to schedule a meeting to learn more abut the basics of wind turbines. Learned more about modeling the system on Simulink.
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Wind

Simulink model, create new model and test

Pick out a few wind turbines to pick from and find information on the wind turbines.

Contact FPM (or another organization if necessary) and begin plans for adding a wind turbine on the roof of Coover.

Use the google drive for group storage

Solar

Simulink model, get existing model to work or create a new model

Research solar equations

Research solar models

Partially completed lab manual

Prepare new presentation for next week

Use the google drive for group storage

The Wind team (Jeffrey, Michael, and Eric) created a list of Wind Turbine vendors and contacted each one about their products. We also finished our first Simulink model of a Wind Turbine. We also continued trying to contact Coover administration about putting a Wind Turbine on the roof of Coover.

The Solar team (Matt, Brian, and Nathaniel) nearly finished the Simulink model for the Solar diagram. Both groups also did research about Wind and Solar so we could better understand our project.

Solar team read the solar documentation that was provided to explain current and voltage curve/equations better on Thursday 9/29. We also sat down and tried to go through the previous design team's lab to analyze the simulink solar model. We were all able to get outputs similar to what was expected in the lab for the first portion of it, but ran into errors when trying to connect the battery to the system. From this we put a small presentation together to explain what we found out and presented on Thursday.

I worked on improving the simulink model.

○ **Pending issues (if applicable)**

So looking into further with what the previous group did on this project. Part of or primary objective has now been refined to include finishing the project with effective implementation of the different elements( real wind turbine not fake etc.) that was not done by the previous group.

Finding a turbine to use for the project is proving to be a lot more complicated than originally thought. We have to not only keep in mind the cost and legitimacy, but we also need to worry about regulations and where we could even put our turbine to use for the project.

NA

Hearing from others about the project. Specifically, hearing back from Coover administration about putting a Wind Turbine on Coover's roof. The wind team can't move forward without hearing back from them.

NA

Understanding Simulink blocks and what the input and outputs are for each.

○ **Individual contributions**

Name	Hours this week	Total	Contribution

Nathaniel Byrne, Group Leader	4	11	I was able to find the information regarding the the different terms in the photo cell equations.
Mike Trischan- Key Concept holder	4	10	Researched different turbines that we could purchase to use for this project. Created a spread sheet comparing specs of different turbines. Contacted different vendors to ask questions to learn more about there products. Contacted Nick David to schedule a meeting to learn more abut the basics of wind turbines.
Matthew Lee & Communications Lead	4.5	10.5	Worked on the Simulink model by attempting to complete the lab manual. Not all parts were cooperating so it may require some redesigning to become completely functional. Created slide show in Drive folder and collaborated with Solar team to put together a presentation while research the characteristics of solar panels.
Jeffrey Szostak, Tech Lead	5	13	I contacted most of the Wind Turbine vendors and did most of the research on them. I also contacted Coover administration, received a reply, and am now currently waiting for a reply from another administrator. I also began discussion with Nick David about going on a tour in the Wind Turbine lab in Coover.
Brian Gronseth Tech Lead	2	6	Read solar documentation to get a better understanding of the V/I curve/equations that affect current. As a team we sat down and each attempted the lab.
Eric Cole	5	12	Started modeling of the wind turbine and finished up modeling of the power conversion systems after the wind turbine.

○ **Comments and extended discussion**

Nope.
Nope
NA
None. The group is going steady.
We seem to be close to touching the hardware, but are needing to run more simulations to fully understand the output with different conditions being applied. The goal is to move on to hardware by the end of this week if prof approves. Simulations arent difficult to do if everything works, which seems to be an issue.
None

○ **Plan for coming week (please describe as what, who, when)**

I zoned out on the wind team's collaboration. Solar will try delegating tasks effects of temperature, microcotroller specifics, matlab simulations, and do work individually more so than group wide.
1. Understand what Generator Speed is, if we can control it, and its relationship with Output Voltage.

2. Be able to draw a block diagram of the Wind Turbine system.
3. Email Nick David about a tour of the Wind Lab.
4. Establish communication with Matt Post about placing a Wind Turbine on the roof of Coover.

Everyone Tasks:

Get access to 1102 Coover & 1301 Coover (power lab & senior design room)  
<https://keys.ece.iastate.edu/rooms/index.php?page=login>

Wind Team's Tasks:

1. Understand what Generator Speed is, if we can control it, and its relationship with Output Voltage.
2. Be able to draw a block diagram of the Wind Turbine system.
3. Email Nick David about a tour of the Wind Lab.
4. Establish communication with Matt Post about placing a Wind Turbine on the roof of Coover.

Solar Team Tasks:

1. Finish lab manual and understand its operation
2. Find where  $I_{sc}$  and  $I_{ph}$  are within model and analyze which is greater
3. Research temperature dependence of solar panels and why
4. Determine how MPPT is affected by battery connections, analyze how voltage fluctuates without MPPT, gain deeper understanding of MPPT

Once again, we will be meeting in 3043 Coover next Thursday (6 October) at 3p.

Learn more about the restrictions pertaining to putting a Wind Turbine on Coover's roof and go on a tour of the Wind Turbine lab. Also, add more onto both the wind and solar Simulink files.

Run more simulations in simulink with and without the mppt/ with and without battery at different temperatures and irradiance so we can move on to hardware related tasks. From there we need to present to Ajarapu.

Continue with model and hopefully complete the wind turbine section of the model.

○ **Summary of weekly advisor meeting (if applicable/optional)**

TA showed up to our weekly presentation

Presented our progress that we made over the week- with Simulink and our research with purchasing a turbine

Dr. Ajarapu was absent again this week but we met with Ankit and he was able to give us some direction on what to work on next.

We were asked to add more onto both the Wind and Solar Simulink files. Constructive criticism was given for both files as well as advice as to how to improve the files.

Presented what we had learned the previous week and found out our tasks for next week

Understand how to properly model the wind turbine.