

MEETING MINUTES

Topic: Deliverables, Design of Experiments, Semester Planning

Wednesday, January 18, 2017 in EGR Capstone Room

5:30 pm – 8:00 pm

Minutes recorded by: David Rankin

Meeting called by: Ali Alkhaiyat

Attendees: David Rankin, Ali Alkhaiyat, Yongseok (Kevin) Park, Juan Carlos Shields

Table 1. Record of Meeting

<p>5:30 pm to 5:50 pm</p>	<p>Winter Break Progress</p> <ul style="list-style-type: none"> • Discussion led by Kevin. The team discussed the progress that we made over the break. The team was able to reduce the budget by over \$250 by researching less expensive materials that we could use while maintaining the integrity of the design and by comparing prices from numerous vendors. • The CAD also received more detail that was in-line with the dimensions of the materials (to-be) purchased.
<p>5:50 am to 6:30 pm</p>	<p>Deliverables</p> <ul style="list-style-type: none"> • Discussion led by David. The team reviewed the deliverables PowerPoint and decided that each team member should complete the safety-training for the NAU ME Fab Shop, if they haven't already. This will allow the entire team to work on the project at the shop. Since David is already certified on the lathe and mill, the team decided not to make it required for other team member to complete the lathe and mill advanced training. • The Wonder Factory will be attending the Science Community STEM Celebration hosted at the NAU Skydome in the middle of March. Our team hopes to have two stations operational by then to have on display. The team will also accompany The Wonder Factory to observe the design's operation and determine any potential flaws that should be fixed prior to UGRADS. • The team will accomplish this by building one full station and complete all tests on this one before building the other three stations. All four stations will be built and presented at UGRADS.
<p>6:30 pm to 7:15 pm</p>	<p>Design of Experiments (DOEs)</p> <ul style="list-style-type: none"> • Discussion led by Carlos. We reviewed the PowerPoint, Word, and Excel files to obtain a grasp of what is expected of our team. We decided that the design of experiments is a test of our design systems/subsystems where we have varying design components that examines the best solution for the design. • We determined several things that we could create DOEs for: <ul style="list-style-type: none"> ○ Generator and Slot Car Racetrack: We will use a mill to rotate the shaft of the generator and known RPMs and test the generator's output voltage and current. We will also test the slot car racetrack by sending the power from the generator to the track to ensure that it will operate at the various conditions with the modification we made to the track's remote control. The modification that we plan to make is to remove the resistor in the remote and turn it into only a on/off switch which will allow the user to

	<p>control the speed of the racecar based on their initial input rotational speed.</p> <ul style="list-style-type: none"> ▪ We will need to determine an effective way to connect the output shaft of the gearbox to the input shaft of the generator. ○ Gears: We will assemble one full station, minus the two front gears. We will use a mill to rotate the rear two gears at the minimum and maximum rotational speeds for 30 minutes to determine if 3-D printed gears will not break or fail in any way at those speeds. If the gears pass the test, we will install the front two gears and test the output voltage of the generator that is created when we hand crank the gearbox. ○ Safety Mechanism: Once one station is assembled, various safety mechanisms will be installed and each will be evaluated on it's ability to keep the gears from rotating when the front cover is open.
<p>7:15 pm to 7:45 pm</p>	<p>BBLearn Exploration and Future Planning</p> <ul style="list-style-type: none"> • Discussion led by Ali. The team reviewed every file in the BBLearn capstone folder and determined what goals we need to obtain soon and which ones are long term. • We determined that based on the schedule, we will need to have purchased all materials for at least one station before the end of next week. We will begin manufacturing no later than next weekend (1/27.) This also means that each team member will need to complete the safety training no later than next weekend (1/27.) • Carlos needs to create several versions of the circuit puzzle prior to the first meeting with The Wonder Factory no later than 1/27. They will then determine which one they want and we will provide information about any potential fund requests from them. David needs to schedule a time to meet with the client prior to progress presentation. He also needs to invite the client to each presentation. • Our team is aiming to have one operational station by Hardware Review 1 with all testing complete by 2/20. This will allow us to build a second station before the event in March with The Wonder Factory. • We plan to have all manufacturing completed by 4/2. After this, we will make any minor changes to each station, as necessary. We will then focus on the final UGRADS poster, presentation, and final report. The CAD package will be done no later than May
<p>7:45 pm to 7:55 pm</p>	<p>Final Remarks</p> <ul style="list-style-type: none"> • Discussion led by Ali. We verified all of the deliverables each team member: • David: Email client, research prices at local stores for less expensive materials, and begin report editing, • Carlos: Begin electric circuit puzzle designs and determine prices for all necessary materials for the different versions. • Kevin: Update website and continually upload current meeting minutes. • Ali: Update Gantt chart, begin editing report, and create doodle to determine our team's available time slots.