# Capstone Journal 2 Grade 2 (STEM Master)

Each response allows a maximum of 250 words, please try and be concise in your answers.

Your email address (**arwa.2019123@stemmenof.moe.edu.eg**) was recorded when you submitted this form.

## You should be better at teamwork this year since you have done this before. How are your team roles different this year than last year? How will this improve your results? \*

**Personal Reflection/Team Collaboration**

Each semester we used to work in a different team from the last one, different members and different ideas with different thinking side for each one. We used to follow some rules and determine the ways that we will work through to reach the best work results and get good solutions. We are now in grade 11 and our overlook is very different from the last year, we understand now how the good work done and how the best ideas get. We always benefit from each other way of thinking each meeting we do. We set together and talk a lot in how to find out the most effective works. We decide this semester to put some rules that we will work on for the end and that are able to be changed for better ones, once we find another way to work through that will give us good results. We first agree with each other that the best thing is to understand each other and give us the permissions to rest and continue work with the good ones. we decide to attend our meetings on time. And discuss all the new results of our research. And one of our new rules that we put is to help other groups and give them information. Also, we said that we can help them in their prototypes. Even there are some of us know more information in Arduino, codes, or even if we can help in connect some groups with a factory that will help them in their work.

## Prototype design is a vital step of the Capstone. What is the most important factor affecting your choice of prototype design? Explain how your prototype design helps you overcome the problem you are solving for your Capstone project. \*

**Using the Engineering Design Process (EDP)**

We learned the EDP from last years and each time we work on a new project following the EDP steps we really reach to the best and effective solutions that solve and achieve the challenge perfectly. We now working on wastewater. First, we searched on the problem of reuse of wastewater. Then, by more research, we find many solutions that already tried we get our sophisticated solution from them. The good solution must have some main design requirements that achieve the challenge perfectly. As we are working on the wastewater that comes from paper industry in our idea, we worked in changing in the process to reduce the wastewater. Then make the water as pure as could to be reused again in the same process. We select to things from the water quality to edit in, the PH and the TDS of the water. Also, we will work on the removal of lignin that results from pulping process. Lignin cause the water to be a black liquor. So, we are working on a chemical that will remove the lignin totally from the water and remove fibers, cellulose from water. That will help in reduce the TDS and not make the water black. Also, this material is ionic liquid that will react with the high PH in the reaction with lignin and water, it will reduce the PH as make it reach to the range from 6 to 8. This range is nearby for the neutral solution. By that we reach to a pure water that we will use again in pulping.

## MA. 2.01 - Imagine an agricultural process change "X" that reduces the nitrate levels "Y" in wastewater more as the change "X" is increased. Specifically, the relationship between nitrate levels "Y" and process change "X" is monotonically decreasing. If you modeled this relationship mathematically with a polynomial function, would this polynomial likely be an even order polynomial or an odd order polynomial? Explain your answer. \*

**Learning Transfer**

In MA.2.01 we studied the polynomial functions. We knew that polynomial function is all functions whose X power is integer positive number. We knew some types of polynomials like monomial function, which is one term only. And Binomial that has 2 terms. Trinomial function which consists of 3 terms and so on. We also study the increasing and decreasing behaves of the polynomials. in our capstone project we usually collecting data for the problem, results and ratios in our test plans, and polynomial functions are a perfect way to represent our data that we collect. For example, in working in an agriculture process. As we work on change the processes that pollute the water and produce a wastewater. In each time I change in the process, I find a change in the nitrate levels in the wastewater that results from this process. The polynomial function help to defined the effective of my change in this process, so when we draw my polynomial function, we notice that the relation is as the change increased, the amount of nitrate decrease. So I know by the graph that my idea of this change is effective and reduce the pollutants in the wastewater results. And achieve the challenge. And by our study in this LO and from the graph, we know that the decreasing function is an odd function.

## In English, you learned how to use the writing process (brainstorm, plan, draft, edit and rewrite) to support development of coherent explanations and arguments. How will this writing process help your team create a professional poster? \*

**Learning Transfer**

In English we are learning useful concepts in the academic writing. In this semester we are following the academic writing as possible to reach to the best overview of our portfolios and posters. We learn in this semester the writing process. There are some main points that we follow that will attract the judge mind to my poster to be interesting in reading it. We first start by the overview of the problem in the brainstorm step, the way of arranging the ideas that make the reader interesting and make him understand the problem that I am working on. Then I put some headlines that lead him to understand the earlier steps of the plan the I will do to solve the problem. Then, the clarify of my steps of the solution and the design of the solution by the arrange of them in first second third step and so on. Then write the draft of the solution in main parts of the results after the test plan was done and clarify hoe my results match the design requirements and achieve the challenge. All these steps of the writing will make my solution a professional solution that attract the judges to my poster and be interesting.