**INTEGRATIVE PROJECT IN COMPUTER SCIENCE AND MATHEMATIC**

420-204-RE

**PROJECT**

**DELIVERABLE-1-**

### **Team**

Form a team with four colleagues of the same section.

### **Team Name**

Select a name for the team and write it in title-case

### **List of Program Courses and Concepts**

List all the program courses that you have already token or are currently taking and list their key concepts.

If there is a discrepancy between team members where a team member did not take a certain course, mention it.

| Course | Concepts |
| --- | --- |
| Calculus 1(all team members took the class) | Limits |
| Calculus 2(all team members took the class) | Integration |
| Mechanics(all teams members took the class) | laws of motion |
| General Chemistry | General chemistry concepts |
| Waves, Optics, and Modern Physics | Simple harmonic motion, lenses, and time relativity |
| Electricity and Magnetism | Forces due to charges and electric fields |

### **Project Idea**

Each team member must think of and choose a project idea then work with their teammate to select the more convenient ones.

| Team Name: |  |
| --- | --- |
| Team Member’s name and Project Idea 1: | M-Amar Kseibi  Idea: Physics simulation hub which includes the idea of charges and shows the details of the charge transfer and imbalance in objects. It can also include other physics concepts, such as: projectile motion and simple harmonic motion.  Idea: Chemistry-related idea, show the concept of pressure through a container simulation, in which the user can tweak certain variables (number of particles, volume of container, temperature, and speed of particles) to understand what affects the pressure in a container. |
| Team Member’s name and Project Idea 2: | Youssif Khalifa  Idea: An application that could help in drawing any function on a graph. As an input we could take the equation of a function f(x) and draw a point on ∀x where f(x) is continuous on a line graph on a stage. We could also make a feature that helps the user to draw the derivative and the antiderivative of the given function. The derivatives could also be drawn on top of the initial function so that the user could compare both of them. Another feature we could include is a program that takes as input a specific matrix and gives its reduced row echelon form or it could also give its inverse. |
| Team Member’s name and Project Idea 3: | Mark Antoun  Idea:A program in which when entering a simple function, and entering the parameters, the program will draw the function on a graph and use riemann sum(a finite number of rectangles) to have an underestimate or overestimate of the area under the graph of the entered function and also showing the rectangles drawn on the graph. |
| Team Member’s name and Project Idea 4: | Anthony Monaco  Idea: Mechanics related program to demonstrate a ball in free fall. The ball will fall from any desired location and can interact with obstacles on its way down. Things like gravity and the effects of objects can be visualized. Also an added minigame where players can try to move obstacles so that the ball can successfully fall into a targeted area (like a garbage can at the bottom).  Idea 2: |
| Selected Project Ideas and why: |  |

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### **Project Description**

Describe you project idea, in brief, all while addressing the following points:

**Concept**

● Describe the physical and/or mathematical concept(s) behind the project.

**Concept Aspects**

● Identify and list the main aspects of the concept such as the problem it addresses, the proposed solution, the solution category among other approaches’ categories.

● The possible variable parameters that would control the user interface animating the concept.

**Typical Input**

● Describe the typical input for the solution of the applied concept to work.

**Expected Output**

● Describe the expected output and how the user interface would look like and what it would allow the user to do.

**Feasibility**

● List the JavaFX, or similar technology, elements, and implementation components that you expect to use to implement the project.

● Justify the feasibility in terms of timeline and team tasks assignment.

**Individual part**

● For each team member, describe their individual part and how it would integrate with the whole project with other team members parts.

Write details here, around 250 words …