

## **STEM Project Rules and Guidelines**

STEM Summer Bridge, a program of the Science, Technology, Engineering and Mathematics First Year Experience (STEM FYE)

### **Project Description:**

Students create a project that optimizes solutions to real-world needs or problems. They are divided in small groups to foster critical thinking skills and collaborative work among peers. Using inquiry-based learning techniques, a designated Faculty Project Mentor guides students through the research, design, application, and presentation stages of the project. Peer Leaders consisting of second-year MDC students will also assist with the facilitation of the project. STEM-related themes, which are listed below, are examples of project areas selected by the faculty mentor. Students will present/showcase their projects during the STEM Project Exhibition, scheduled from 10:30 am to 1:00 pm on Wednesday, July 30<sup>th</sup>. Faculty Mentors and Peer Leaders are highly encouraged to attend to support student presentations. A selected group of evaluators will review each project. Peers, college faculty and staff, parents, and high school teachers may be invited to attend this event.

### **STEM Project Themes:**

- Robotics/engineering design
- Mobile application technologies
- Energy efficiency/the environment
- Genetics/Drug delivery
- Speed, velocity, acceleration

### **General Rules:**

- Student groups consist of 3 to 6 students
- Students must obtain Faculty Mentor approval prior to experimentation and prior to submitting their posters for printing
- Projects involving human subjects or human data, animal subjects or animal data, biological agents must follow Institutional Review Board Guidelines. Faculty Mentor are required to obtain approval prior to engaging in these areas of research
- Students must follow the project timeline

### **Project Requirements:**

Students must follow fundamentals of scientific research (listed below). Failure to follow scientific research general guidelines may lead to failed projects, poor results, and wasted time.

- ✓ Project question: The scientific question about the hypothesis. Keep in mind that the project should optimize solutions to real-world needs or problems.

- ✓ Formulate a Hypothesis: Stems from the question. It is an idea of what you think might happen.
- ✓ Research and Works cited: The research conducted to shape the project question and hypothesis. Keep detailed notes so you can refer back to your research when citations are needed.
- ✓ Design the Experiment: Demonstration, using good experimental techniques, including a detailed description of the experiment. It is recommended to keep it simple, given the limited time frame of the project.
- ✓ Data Collection: Data collected during the experiment to support a conclusion must be recorded accurately and precisely. Utilize numbers, rather than just observations.
- ✓ Formulating a conclusion: Did the data deriving from your experiment support your hypothesis? Your goal should be to accurately report results from your data, not to prove your hypothesis. In research, data often does not prove a hypothesis, but actually leads to other findings or simply more questions that may lead to further research or project development.
- ✓ Present your project: This will be done during the STEM Project Exhibition. One poster per group project is required and it must follow the Project Presentation Template provided by program coordinator. Reporting a sample size and statistical analysis of the data is highly encouraged. Remember that your projects will be evaluated by a Review Committee and presented to the public. Every student in the group should have equally contributed to the project and be able to answer questions about the project. This will be part of the evaluation conducted by Review Committee members.

#### **Project Deadlines:**

<b>Items</b>	<b>Deadline</b>
Project Knowledge: Students must have a detailed understanding of the project design, guidelines, and timeline.	Friday, June 27th
Project status to STEM FYE: This must include list of group participants and a detailed explanation of what will be done in the research project and where it will be conducted. This must include status of data collection.	Monday, July 7th
Project status to STEM FYE: This must include status of data collection.	Friday, July 18 <sup>th</sup>
Submit poster printing request using the Project Presentation template	Wednesday, July 23rd
Presentation of Project during STEM Project Exhibition	Wednesday, July 30th