



## Ministry of education

### Central STEM unit

#### Capstone Calendar 1<sup>st</sup> semester (2021-2022)



Week	Engineering Design Process (EDP) progress:	Students' work (teacher will follow during the sessions)	what should be done in the Portfolio	what should be done in the Prototype	what should be done in the Poster ( <a href="#">accomplished rate is the reference here, students need to review the rubrics to move to distinguished</a> )	Journal	Exams	Comments
1	<ul style="list-style-type: none"> <li>Present and Justify a Problem and Solution Requirements</li> </ul>	<ul style="list-style-type: none"> <li>Introduce Egypt Grand Challenges, Capstone Challenge, Capstone Semester Dates; Introduce Capstone Portfolio template, Rubrics</li> <li>Links for The shard files for the poster and portfolio</li> <li>Teams Formed, Research problems and prior solutions</li> <li>Students' representation skills</li> <li>Document in the Capstone Portfolio (Egypt grand challenges, and problem to be solved)</li> <li>The Poster design</li> </ul>	<ul style="list-style-type: none"> <li>Each team is assigned a TEAM NUMBER</li> <li>Each team's has an <b>online shared Portfolio</b> Name MUST follow this format Year-Semester Number-Team Number 2021-1-Team Number</li> <li><b>Egypt Grand Challenge(s)</b> Which Egyptian Grand Challenge(s) are you addressing, and why are they important to address?</li> <li><b>Problem to be solved</b></li> <li>What specific problem are you addressing?</li> <li>What positive and negative consequences that are related to dealing with that problem?</li> </ul>		Choose the design for the poster, the theme, the fonts, the title name, the logos, and colors according to the rubrics			
2	<ul style="list-style-type: none"> <li>Present and Justify a Problem and Solution Requirements</li> <li>Generating and Defending a Solution</li> </ul>	<ul style="list-style-type: none"> <li>Research prior solutions, noting prior attempts strengths and weaknesses</li> <li>Identify design requirements, Brainstorm possible solutions</li> <li>Identify the design requirements that a good solution would meet</li> <li>Document in the Capstone Portfolio (research, list of references -its place at the end of the file-, other solutions already tried)</li> <li>Poster design</li> <li>Students' representation skills</li> </ul>	<p><b>Research</b> Which topics did you research about the problems? Students discuss factors that are related to the problem from different perspectives.</p> <p>Which topics did you research about the solutions? Students discuss technologies, scientific topics, or materials or any other factors that are related to the solution.</p> <p><b>Other Solutions Already Tried</b> What are the solutions that have been applied trying to solve this problem?</p> <p>Why are the strengths and weakness of those solutions?</p>		Improve the poster design and colors	Capstone journal <a href="#">one</a> grade 11, 12.		

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3	<ul style="list-style-type: none"> <li>Generating and Defending a Solution</li> </ul>	<ul style="list-style-type: none"> <li>Select a solution and justify why it is a good solution.</li> <li>Select which design requirements that will be tested in the prototype from among other design requirements</li> <li>Document in the Capstone Portfolio (Solution and Design Requirements, Selection of Solution)</li> <li>the introduction and abstract in the poster</li> <li>Students' representation skills</li> </ul>	<p><b>Solution and Design Requirements</b> What characteristics (Solution Requirements) would a successful solution have, and how each of these characteristics can be met?</p> <p>Which design requirements did you choose and why did you choose it?</p> <p><b>Selection of Solution</b> Describe the solution you decided to pursue and why did you choose it? Students will demonstrate the methods they will follow to solve the problem</p>	<p>The design requirements give the students the chance to have an idea about what the prototype should be tested for, what materials can be used.</p>	<p><u>Start editing the abstract</u> (it should be written by the end of the work because it is the brief description of the entire work described in the poster)</p> <p><b>Introduction</b> Clearly and objectively identifies the problem and summarizes prior solution attempts strengths and weaknesses. Includes design requirements for a new solution that can be tested Summarizes how the team's solution was chosen and how it addresses design requirements</p>	Capstone journal <u>one</u> grade 10.		
4	<ul style="list-style-type: none"> <li>Generating and Defending a Solution</li> </ul>	<ul style="list-style-type: none"> <li>Select a prototype to design, build, and test the design requirements for the identified prototype,</li> <li>Document in the Capstone Portfolio (Selection of Prototype, Materials and Methods)</li> <li>The poster (Materials and methods)</li> <li>Create and submit a proposal for the Capstone Prototype</li> <li>Capstone Budget Guidelines signed</li> <li><b>Capstone Review Panel</b></li> </ul>	<p><b>Selection of Prototype</b> Describe in detail the prototype you have decided to construct, and how it will meet the design requirements you have chosen? In what ways can your prototype be tested?</p> <p><b>Materials and Methods</b> List the materials you used to make your prototype. (Table: Item, quantity, description –if needed, usage, cost, source of purchase, picture) List the safety precautions you took to ensure your team is being safe.</p>	<p>The first design draft should be submitted on the session A in this week, review by <b>the panel</b>, give students the <u>feedback</u>, students will make the needed modifications .</p>	<p><b>Materials and Methods</b> Prototype materials lists and/or illustrations are summarized Describe how the prototype was constructed</p>	Capstone journal <u>two</u> grade 11, 12.		

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5	<ul style="list-style-type: none"> <li>Constructing and Testing a Prototype</li> </ul>	<ul style="list-style-type: none"> <li><b>Capstone Review Panel</b> feedback discussion.</li> <li>Create a Test <b>Plan</b> to test whether the prototype meets the selected design requirements.</li> <li>Review the safety precautions</li> <li>Build the prototype.</li> <li>Document in the Capstone Portfolio (Test plan)</li> <li>The poster (review all written parts, continue improving the materials and methods)</li> </ul>	<p><b>Test Plan</b> List the design requirements you have chosen to test with your prototype.</p> <p>List the steps for each test to conduct on the prototype (this test plan should be written in a way that supports repetition and testing by others)</p>	<p>The panel feedback should be delivered to all students. They will make the needed modifications on the design. get the needed materials</p> <p><b>Start building the prototype.</b></p>	<p><b>Continue Materials and Methods</b> A summary of Methods of the test plan for the prototype includes a summary of tests conducted and how they address design requirements</p>	Capstone journal <u>two</u> grade 10.		
6	<ul style="list-style-type: none"> <li>Constructing and Testing a Prototype</li> </ul>	<ul style="list-style-type: none"> <li>Review the materials, methods, and safety rules.</li> <li>Build the prototype.</li> <li>Review all the written parts in the Capstone Portfolio</li> <li>Review all the written parts in the Capstone Poster</li> </ul>	Improve the portfolio while working on building the prototype	Continue working on the prototype.	Improve the Poster while working on building the prototype	Capstone journal <u>three</u> grade 11, 12.		
7	<ul style="list-style-type: none"> <li>Constructing and Testing a Prototype</li> </ul>	<ul style="list-style-type: none"> <li>Implement the test Plan.</li> <li>Document the tests, the results, and any modifications in the Portfolio.</li> <li>Revise the Prototype design based on test results (do as long as needed or until time runs out)</li> </ul>	<p><b>Data Collection</b> List all data collected in your testing here</p> <p><b>What measurement tools did you use? What level of precision did you use in measurement?</b></p> <p><b>Provide a visual representation of your data and results. The best visual representations tell the story of your results without the need for additional writing.</b></p>	implement the test plan (test the prototype according to the chosen design requirements	<p><b>Results</b> All types of prototype testing results are presented, whether positive or negative Supporting documentation from the Capstone Portfolio is available to show data for tests or scenarios that were conducted for the prototype testing results Includes a table or figure that is appropriate for the type of prototype test results being described</p>	Capstone journal <u>three</u> grade 10.		

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8		Review all the work and make sure that all team members have the same level of the understanding of what have been done>	Improve the portfolio while working on building the prototype	Continue working on improving the prototype.	Improve the Poster while working on building the prototype		practical exams during this week for grade 10 and 11 (Week 8)	Midterm exam (Week 8)
9	<ul style="list-style-type: none"> <li>Constructing and Testing a Prototype; Evaluation, Reflection, Recommendations</li> </ul>	<ul style="list-style-type: none"> <li>Continue the implementation of the Test Plan and document</li> <li>Continue to Revise Prototypes based on test results (do as long as needed or until time runs out). Prepare Capstone Poster for Exhibition using the rubrics and Capstone Poster Template.</li> <li>Document in the Capstone Portfolio (Data collection)</li> <li>The poster (improving the whole poster, continue writing the results)</li> <li>Students' representation skills</li> </ul>	<p>Continue the Data Collection</p> <p>Improve the portfolio while working on building the prototype</p>	Continue implementing the test plan after improving the prototype (test the prototype according to the chosen design requirements)	improve the Results part	Capstone journal <u>four</u> grade 11, 12.		

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10	<ul style="list-style-type: none"> <li>EDP Progress: Evaluation, Reflection, Recommendations</li> </ul>	<ul style="list-style-type: none"> <li>Analyze the Data—include analysis of the effectiveness of the design</li> <li>the recommendation for future research, development written for others to replicate.</li> <li>Document in the Capstone Portfolio (Analysis and discussion, recommendation, finalize the learning outcomes' part)</li> <li>The poster (Analysis, conclusion, recommendation)</li> <li>Students' representation skills</li> </ul>	<p><b>Analysis and Discussion</b>  What is the analysis of the prototype behavior, and the test plan results?  What conclusions do you reach from the data you collected?  (Your test and your measurements should be accurate enough to draw conclusions)  (The data should demonstrate that the prototype met the identified design requirements)</p> <p><b>Recommendations</b>  What recommendations do you have for future work in this area?  What would you tell another team who wanted to start where you stopped on your solution to help them?</p> <p><b>Learning Outcomes</b>  Which 10 discipline learning outcomes did you identify as related to your Design Challenge?  Explain how each identified learning outcome was transferred to your Capstone.</p>	Finalize the decorations and final look for the prototype if it needs	<p><b>Analysis</b>  Discussion ties performance results (positive and negative) to the original challenge or problem being addressed and to the Grand Challenge  Analysis ties the prototype testing results to the design requirements  Analysis is supported by pictures, graphs, charts and other visuals, and prototype test results  Analysis is supported by scientific laws and theories and provides evidence of learning transfer of discipline learning outcomes</p> <p><b>Conclusions</b>  Conclusions are drawn from the prototype test results and analysis.</p> <p><b>Recommendations</b>  Recommendations for future study are provided, including specific ways the project could be improved in the future</p>	Capstone journal <u>four</u> grade 10.		

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11	<ul style="list-style-type: none"> <li>Finalize the Poster, the Portfolio, and the prototype.</li> </ul>	<ul style="list-style-type: none"> <li>Finalizing and reviewing the Poster and the portfolio to be ready for submit</li> <li>Finalizing the Prototype for exhibition, (make sure that all work is completed)</li> <li>representations training.</li> </ul>	<p><b>review the research list at the end of the portfolio</b></p> <p><b>List the research sources you have used for your project in APA format.</b></p> <p><b>Review the whole portfolio.</b></p>	Finalize the decorations and final look for the prototype if it needs	<p><b>Literature cited</b></p> <p>Includes only sources cited in the poster text (at least 5 credible sources)</p> <p>Different kinds of sources (paper- books, encyclopedia websites) not only websites</p> <p>includes only papers read by the students Is prepared according to the American Psychological Association (APA) style guidelines</p> <p>Review <b>the abstract</b></p> <p>"understandable without reading the entire poster"</p> <p>Includes (1) purpose of the study, (2) brief statement of what was done (without including minor details of the methods), (3) brief statement of major findings, and (4) major conclusions</p> <p><b>Review the whole poster</b></p>	Capstone journal <u>five</u> grade 11, 12.		
12	<ul style="list-style-type: none"> <li>Experimental exhibition</li> </ul>					Capstone journal <u>five</u> grade 10.		

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13						Make up journal.		
14								