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Egypt STEM School

Student and Parent Handbook

Capstone Appendix

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Appendix I: Capstones

What is a Capstone?

Capstone is a part of the curriculum, which helps to make schoolwork more relevant to students' lives by engaging all students in small groups to solve real-world problems related to Egypt's Grand Challenges.

- Capstones are one semester in length, 2 sessions/week with scheduled field trips.
- Engineering Design Process is used as a systematic approach to problem solving
- Build testable prototypes.
- Use Fab Lab and other school labs to conduct work.
- Capstones are similar to project-based learning curricula, but integrate across disciplines
- Individual formative assessments and group summative assessments are included.
- Teachers facilitate student work.
- Outside partners, such as universities, are engaged to support student work.

What are the STEM School's Egypt Grand Challenges?

- Improve the use of alternative energies
- Recycle garbage and waste for economic and environmental purposes
- Deal with urban congestion and its consequences
- Work to eradicate public health issues/disease
- Increase the industrial and agricultural bases of Egypt
- Address and reduce pollution fouling our air, water and soil
- Improve uses of arid areas
- Manage and increase the sources of clean water
- Deal with population growth and its consequences
- Improve the scientific and technological environment for all
- Reduce and adapt to the effect of climatic change

What is the engineering design process?

Engineering design process is a systematic approach to problem solving.



What is my role?

- Work in collaborative teams on a Capstone Challenge shared by the whole grade
- Meet in Capstone Class two times per week
- Apply the engineering design process
- Choose a problem to research, identify solution requirements and a solution to pursue
- Work with Capstone Teacher and Capstone Leader to identify approved out of school experts to support your work
- Use Fab Lab and other school labs always follow Safety Handbook
- Build a prototype to test against design requirements
- Document work in a Capstone Portfolio
- Communicate the work through poster, prototype and portfolio, and demonstrated through an exhibition
- Reflect on learning through Journal administration
- Use Capstone Rubrics to guide your work—these are the standards your work will be graded
- MUST Follow ALL School Safety Rules

How is my Capstone grade calculated?

Category	Assessment Tool	Evidence
Personal Journals – 40%	Personal Journal Rubric	Student Personal Journals administered every two weeks in the Capstone session
Prototype – 10%	Capstone Exhibition Rubric	Student Team Capstone Prototype
Portfolio – 10%	Capstone Exhibition Rubric	Student Team Capstone Portfolio
Capstone Poster – 40%	Capstone Exhibition Rubric	Student Team Capstone Poster

How is my work assessed?

Student Capstone Products are assessed by trained teachers and external evaluators using rubrics. A rubric consists of a set of criteria that include descriptions of levels of performance used to assess performance. Students are given the rubrics or links to the rubrics by their Capstone Session Teachers. A Rubric Scoring Explanation is also distributed. There are two rubrics designed to assess the products:

- Personal Journal Rubric (Journals)
- Exhibition Rubric (Portfolios, Prototypes, Poster)

What are the Student Capstone Journal Rules for the Journal Administration?

- Students take the Journal Assessment during a Capstone Class.
- All students in the same grade at ALL schools take the Journal Assessment at the same time.
- Students use a set amount of the Capstone Session time for the Journal Assessment.
- Students do NOT work in groups—Students work Individually.
- Students do NOT use the Internet to look up information.
- Students do NOT use the Capstone Portfolio for information.
- Students are allowed 1 Capstone Journal makeup, when approved.
- The Capstone Journal makeup is administered at the end of the semester.
- Questions about Capstone Journal grades are sent to the Academic Deputy.

What do the “colors” mean in Journal Rubric Scoring?

- A RED indicates that the student’s response does not answer the prompt or indicates that the student’s response does not display a correct understanding of the topic being addressed.
- A YELLOW indicates that the student’s response does not address every aspect of the prompt question. The student should keep in mind that prompt questions often have multiple parts and all must be addressed in a comprehensive answer. For example, consider the prompt question asking the student to: (1) provide a measurement technique that will be used in capstone test plan and (2) describe the reason that measurement was selected. The student’s journal response must address both questions with specific answers. A YELLOW grade would be applied if any of the following situations: (1) the student did not specifically answer both questions, (2) all answers are provided but they are too general in nature. (e.g., “*I will measure speed*” is too general of a response. Since the question asks for technique, the student must describe “how” speed will be measured.)
- A GREEN indicates that the student’s response addresses every aspect of the prompt question. If multiple parts are in the journal prompt, each is answered accurately and with specifics. A GREEN score by the graders indicates that the grader’s assess that the student has a comprehensive understanding of the topics in the journal prompt. GREEN is an excellent score because it indicates that the student can demonstrate understanding of the material.
- A BLUE indicates that the student’s response meets all of the criteria noted in the prior “green” section and the student’s response provides additional information that demonstrates a deeper understanding and displays how the student is able to apply their understanding to broader situations. For example, a BLUE grade would be given to a student response that includes additional information, such as, “*The reason that I selected these test measurements for the plan is because they reflect the expected conditions that the capstone product would experience in real-life. We found this information from the following research [list specific source], and this is likely to be the conditions in Egypt.*” A BLUE from graders is reserved for very comprehensive journal answers.

If I have an EXCUSED absence, how do I makeup a journal assessment?

- Only students with an **excused absence** will be able to makeup **one journal**.
- **One** makeup journal per grade for each semester will be created with general questions that are more difficult than the original journal questions.
- **All makeup** journals will be administered at the same time at the end of each semester
- Journals will be evaluated by teachers using the same evaluation process used for prior journals.
- Usually, there are 5 journals administered
- The lowest score of the journals for each semester will be dropped.

Where do I find all of the information needed for the Capstone?

The Capstone Teachers have all of the information. Ask your Capstone Teacher where to get any missing information.

What are the Out of School Expert roles?

Engaging higher education faculty and STEM – oriented business professionals in Capstones enriches students' experiences. These STEM experts support the students through several approaches, such as coaching, mentoring, mini-courses, equipment and supplies, etc. The support comes in many forms, such as, field trips, experts meeting students at the schools, Skype and email. The STEM professionals add authenticity to the Capstones.

The Capstone Leaders and Teachers work with the students to help identify and invite approved and appropriate experts to work with the students. Students **MUST** work with Capstone Teachers and Capstone Leaders to work with outside of school Experts and obtain permission before working with an Out of School Expert.

Experts are recruited and trained to evaluate the Capstone Teams' Prototypes and Posters at a Capstone Exhibition using Exhibition Rubrics.

How can I build on work completed by other students?

Student Use of "Prior Work"

All innovation is based on prior work. This prior work might be your own, a fellow student's or a professional or researcher in a STEM field. You are welcome to use prior work as part of your Capstone, whether that work is yours or someone else's work, but you must do the following:

- (a) add new work of your own during this semester and understand that only your new work will be graded,
- (b) cite the prior work so that it is clear which parts of your Capstone are prior work and which are your new work, and
- (c) include prior work in your poster's "Introduction" section only. All other portions of your poster must contain only your new work.

Appendix II Academic Honesty

Students have easy access to voluminous amounts of information that will be the basis for their learning while in the Egyptian STEM School. The work of generations of scholars before us is the foundation for our future discoveries. We may learn from their brilliant work however, we may never steal it or pass it off as our own. It is in this spirit that the Egyptian STEM School determined the following consequences for such acts. Such acts undermine the very fabric of our institution and have no place in our school. (The following language replaces the Academic Honesty Language in prior Student and Parent Handbooks)

Plagiarism: To present as new or original an idea or product derived from an existing source; to commit —literary theft: Using the ideas, data, or language of another individual without specific or proper acknowledgment.

In addition, other forms of **cheating** -- using or attempting to use unauthorized assistance, material or study aides in examinations or other academic work include, but are not limited to, the following:

- Using the internet for answers during ANY assessment, including Capstone Journals
- Hacking online to gain access to assessments without permission, including Capstone Journals
- Commenting or revealing the test or content or answers to other students prior to their exam.
- Communicating with other students during an exam, test, quiz, or any other form of evaluation.
- Using unauthorized materials, i.e. —cheat sheets, flash drive, hard drive and electronic devices of any kind.
- Using unauthorized prepared responses during assessments, including Capstone Journals
- Using another students answers
- Purposefully allowing another student to see or to use one's work at any time during any form of evaluation.
- Creating or changing laboratory data or submitting reports based on this data. This includes making up or falsifying data for deceptive purposes, citing nonexistent articles, or contriving sources.
- Using other students prior work, such as Capstone Posters, Portfolios, Prototype without generating new prototyping, data and documenting new work, without citing the source

Deliberate deception, including but not limited to the following:

1. Tampering with, falsifying, or forging school documents.
2. Making deliberately deceptive phone calls to the attendance office or school officials.
3. Tampering with or changing attendance rosters, grade books, or computer records.
4. Lying about the need for an extension for an exam or paper.
5. Continuing to write when time is up during an exam.

Consequences

All management of Academic Honesty violations in any form is initially the responsibility of the classroom teacher in collaboration with the Principal. After an accusation of academic dishonesty, the student, his/her parent[s] and the student's Principal will be notified.

An Academic Honesty committee will be assembled to determine whether Academic Honesty rules have been violated and to determine the consequences. The committee will consist of the Principal, the teacher closest to the accusation, and at least one person from outside the school, either Supervisor or Central Ministry. This committee will decide consequences of academic dishonesty on a case-by-case basis rather than by following a prescribed set of consequences. The student and/or parent will have an opportunity to provide the student's perspective to this committee before their decision is made. The committee will submit a report following their decision to the Ministry for final review.

The most important impacts of Academic Honesty violations involve safety and school culture. The following describes, but is not limited to, the varied degrees of harm violations may cause:

- Violations that harm students or staff, or create significant risk to the safety of students or staff are the most serious and should carry the most severe consequences leading up to and including expulsion.
- Violations that impact Academic Honesty of fellow students, such as disseminating assessment questions across the school or to other schools represent the next most important negative impact on school culture.
- The impact of violations on the goals and culture of the school should be considered when comparing cases that involve isolated, poor judgment versus premeditated action, or plagiarism on a writing assignment versus sharing exam questions with other schools, or first offenses versus a pattern of academic dishonesty that contaminates the school culture.

Consequences selected by the Academic Honesty committee are likely to increase from reduction in score on the associated assessment item to elimination of scores and a probationary period during which the student will not violate Academic Honesty guidelines and, if necessary, take on a project designed to positively impact the school culture. Such a project is not intended to be punitive and therefore should not be humiliating in nature. Such a project given during a probationary period should be an opportunity to positively impact school culture, such as improving the conditions of the school. Suspension and expulsion should be avoided unless the student is clearly a threat to the school's culture that cannot be rectified by keeping the student in the school.

Appendix III Capstone Form

Capstone Prototype Preliminary Review
Capstone Materials Guidelines

CAPSTONE PROTOTYPE PRELIMINARY REVIEW

All groups must complete this form and submit for approval prior to beginning prototype work

<i>Capstone title:</i>	
<i>Team Number:</i>	
<i>Capstone Team members</i>	<i>Supervisor teacher</i>
<i>Capstone Recommended Solution:</i> Summary should minimally include the sound STEM principles the solution is based	
<i>Capstone Prototype Summary:</i> Summary should include -how the prototype connects to recommended solution -how the team will adhere to school and lab safety policies	1-
<i>Additional comments:</i>	

Capstone Material Guidelines

- Each capstone group has a budget of up to 600 EGP.
- You will be reimbursed for all items up to 600 EGP total with a **legitimate documented receipt (stamped or other official receipt)**. Taxes will not be reimbursed.
- You must submit your receipts by
- Your group will be reimbursed no later than
- Your models or prototypes will be evaluated with respect to your group's ability to stay within its budget. Do *not* spend more than the 600 EGP you will be reimbursed, as this will *not* increase your capstone evaluation. Be creative with your budget.
- Your capstone group may also freely use materials available at the school.
- All members of your capstone group must sign and return this document by

Please sign below indicating that you have reviewed the material above and received a written copy to distribute to your capstone group.

Capstone Group Number: ____

Title: _____

Group Member Name (PRINT)	Signature