Flowery Branch High School STEAM Program
Senior Capstone Project

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Per the Georgia Department of Education, "in an effort to provide all students with an education that leads them to being college and career ready, students will participate in work-based learning and/or develop a career-related capstone project. Indicator number 7 under Exceeding the Bar on the College and Career Ready Performance Index (CCRPI), states 'Percent of graduates completing a career-related WorkBased Learning Program or a career-related capstone project' . . . These projects are a way to allow students to uniquely show their talents related to their career area of interest. Reflecting on who they are while showing what they want to do, the project provides students with the opportunity to explore a career of personal or professional interest and to address the latest trends or issues through focused study and applied research. The project allows students to demonstrate their ability to synthesize and apply the knowledge and skills acquired in their academic program to real-world issues and problems. These final projects should affirm students' ability to think critically and creatively, to solve practical problems, to make reasoned and ethical decisions, and to communicate effectively" (GA DOE, 2016).

With this in mind, all FBHS STEAM students will complete a Senior Capstone Project (SCP) in a STEAM field by the end of March of their senior year, followed by a presentation of their capstone project in April. This capstone may begin after completing the required engineering pathway and should strive to actively apply an integrated approach to STEAM concepts (Science, Technology, Engineering, Arts, Mathematics).

Goals for Capstone Project per the Georgia Department of Education
1. To provide students with the opportunity to apply the knowledge and skills acquired in their courses to research relating to a career/special interest area.
2. To allow students to extend their academic experience into areas of personal career interests, to include working with new ideas, organizations, and individuals.
3. To encourage students to think critically and creatively about academic, professional, and/or social issues and to further develop their analytical and ethical leadership skills.
4. To provide students with the opportunity to refine research skills and demonstrate their proficiency in written and/or oral communication skills.

Requirements
All STEAM Capstone students will:
1. Acquire a Capstone STEAM advisor/mentor.
2. Complete and submit an Independent Research Paper detailing their capstone study.
3. ePortfolio of project journey using Weebly Sites.
4. Produce a Capstone Product or Process.
5. Present a Capstone Oral Defense to the STEAM Capstone Board.

Capstone Pathways

The STEAM Capstone may be achieved through one of the following methods.

1. AP Research Course
    a. Students must complete the AP Seminar prerequisite to complete this course.
    b. The AP Research paper, presentation, and mentor requirements will fulfill the STEAM SCP requirements, provided the research fulfills a STEAM specified field.
2. Honors WorkBased Learning in a STEAM field.
    a. The HWBL Mentor Requirements, Portfolio, and Presentation will meet the STEAM SCP; however, HWBL students are still required to complete and submit the Independent Research Paper Requirements.
3. Research, Design, and Project Management (ENGR-RDPM is a 4th Level Engineering Course with STEAM Engineering instructors). Requirements are listed on the GA DOE website. They include:
    a. Technical Research
    b. Documented Design Solution
    c. Solution Evaluation
    d. Communicate Findings
        i. Portfolio
        ii. Research Paper
        iii. Oral Presentation

Mentor/Advisor

Students are required to have a mentor/advisor for their SCP and STEAM Faculty Contact (FC). The mentor/advisor must be an expert in the chosen field and may not be the same person as their STEAM FC. It is the student's responsibility to acquire a mentor/advisor and get their approval by the scheduled deadline their senior year. Approval includes having his or her mentor complete the subsequent Mentor/Advisor Forms.

STEAM Faculty Contact is as follows:

1. AP Research: Chelsey Woodall
2. RDPM: Harmon Tison
3. HWBL: assigned to either Woodall or Tison

Mentor/Advisors Forms

1. Mentor/Advisors must complete the following Mentor/Advisor Agreement Forms (Part 1 and 2) by the scheduled deadline.
2. Mentees are to arrange end-of-the-month meetings with their mentor and have them complete the form approving the student's weekly hours dedicated to the SCP.

Independent Research Paper (IRP) Requirements

● All formatting should follow APA Style, including title sections, layout, font, spacing, in-text citations, and works cited page. The student is responsible for knowledge of APA formatting.
● Minimum of 10 sources.
● Length: 1200-1500 words, not including the title page or works cited page.
● Student work should reflect a thorough review and self-evaluation of writing, devoid of grammatical errors and exhibiting insightful word choice, structure, and sentence variation.
● Paper must be submitted via the specified online platform for plagiarism review as well as a hard copy to the STEAM Coordinator no later than the last week of March to be considered as fulfilling the student's SCP.

- Plagiarism: Plagiarism is the act of using any words, ideas, or research work as one's own. Any form of plagiarism is considered cheating and will result in invalidation of a student's entire SCP as well as subject the student to the STEAM Honor Code and possible subsequent consequences, including but not limited to loss of STEAM privileges and removal from the STEAM Program.

  IRP Guidelines:
  - Title Page
    - Follows APA Format
  - Abstract
    - Follows APA Format
  - Introduction
    - Provides necessary background for understanding of project objective and contextualizes the student's initial inquiry
    - Includes a Literature Review of previous work in chosen area to demonstrate student's awareness of the field
  - Project Outline
    - Research Design and Methodology
      - Explains and justifies a student's chosen method to research and design their project as well as timeline for completing the research and design.
  - Results, Product or Findings
    - Presents the student's results, which may be research or product based
  - Discussion, Analysis, and/or Evaluation
    - Interprets project results strengths and limitations.
  - Conclusion and Future Directions
    - Discusses how these results connect to the existing STEAM field.
  - Bibliography/Works Cited
    - Includes all referenced work in APA format.

Presentation Requirements

To fulfill the STEAM SCP, students will showcase their final project in April of their senior year. This showing will be a formal presentation to the STEAM Senior Capstone Review Board and should:
- Summarize the student's research paper
- Detail how this project aligns with ENG and Art standards
- Demonstrate visual evidence of their work process via presentation board or an online medium. (*video reference may be included but should not take more than 10% of the student's live presentation time and should prove necessary to a cohesive understanding of the project).
- Demonstrate mastery of their chosen topic through a question/answer portion via the review board.

ePortfolio Requirements

An ePortfolio is a collection of work (evidence) in an electronic format that showcases learning over time. The STEAM ePortfolio will be a student-made website. When you think about your ePortfolio and the types of evidence that it contains, it is important to think carefully about its purpose and intended audience.
An ePortfolio may contain all or some of the following:
- Files of various formats (text, pictures, video, etc.)
- Evidence related to courses taken, programs of study, etc.
- Writing samples (which might include several drafts to show development and improvement)
- Projects prepared for class or extracurricular activities
- Evidence of creativity and performance
- Evidence of extracurricular or co-curricular activities, including examples of leadership
- Evaluations, analysis and recommendations

The Capstone ePortfolio requirements will narrow the scope of work to include documentation on your entire project. You will use Weebly, a free website builder to construct your site. You should include information about you, highlights from your STEAM journey (samples of projects and work), community service projects, professional documents, and information about your capstone project. Basically, a stranger should be able to open your website and learn about you and what your STEAM experience and capstone project were about.