Course Title: STEAM Capstone and Practicum

Course #: 1515-1516

Course Description:
The major skills and concepts learned in Intro to STEAM, Advanced STEAM, and Engineering Design converge in the Engineering Capstone and Practicum. In this course students will work as a team to develop a solution to a technical problem of their choice. Students identify an issue, problem, or need and, using the engineering design process, research, design, build, test, and present their solution to a panel of peers, faculty, and/or professionals. In addition, students will partake in a practicum where they will choose a career interest and related company to spend time gaining field experience over the course of the school year.

UC/CSU Approval: “d” approved

Grade Level: 12

Estimated Homework Per Week: 1-2 hours

Prerequisite: Successful completion of Introduction to STEAM and Advanced STEAM. Completion or concurrent enrollment in Engineering Design.

Recommended Prerequisite Skills: Basic desktop computer knowledge, programming languages, tool and machine use, spreadsheets, CAD.

Course Grade Scale:
- Homework: 20%
- Projects: 50%
- Final Project: 30%

Major Assessments/Units/Topics:
Pertaining to the following topics, students will learn concepts and skills that apply while utilizing them with hypothetical projects. Once students grasp the information they will then apply it to their capstone project. Assessments will consist of progress updates, deliverables, and presentations throughout the project’s life. The first semester final will include schematic design testing results. The second semester final will be solution presentations to peers and professionals.
1. Project Management
   a. Scope
   b. Schedule - Gantt charts
   c. Resources
   d. Budget - Spreadsheets
   e. Time - Time management
   f. Deliverables - Internal and External
2. Research
   a. Techniques
   b. Feasibility
   c. Demographics
3. Design
   a. Preliminary Design
   b. Flow Charts
   c. Schematics
   d. Bill of Materials
4. Prototyping
   a. 3D Modeling
   b. Scaled Models
5. Testing - Students will
   a. Beta Testing
   b. Program Testing
   c. Schematic Testing
6. Analysis
   a. Data Analysis
   b. Modifications
7. Resolutions
8. Marketing
   a. Advertising
   b. Demographics
   c. Graphic Design