

Capstone Course Outline

In this course, students will choose to apply the knowledge they have learned in their previous courses to develop a solution to a community problem. They will research a problem in their community and develop and test their solution and present their solution to a business or organization.

Lesson	Learning Objectives	Time
Understand the Problem	Students will research different problems in their community that might be able to be solved using STEM skills they have learned in their pathway. The solution should make an impact in their community. The problem can be related to engineering design, manufacturing, or computer science. They will present their problem to their teacher in the form of an ignite talk to pitch the idea they would like to work on. The idea should include design criteria for the problem to be solved.	Week 1
Further Research and Design Ideas	Students should take two weeks to further research their problem and develop at least three different design ideas that could potentially solve the problem. They should do their own analysis of their design ideas to determine if they meet their design criteria.	Week 3
Gaining Mentors	Students should present the three design ideas to an industry mentor that can provide them feedback and help guide them in the right direction to be successful with their project.	Week 4
Prototyping	Students should develop an initial prototype of their project ideas to prove proof of concept. They should determine any challenges their designs may have would not allow them to meet their design criteria. They can narrow down to one design idea that they can put additional investment and design detail into. The student should share the modeling and design ideas and gain feedback from their industry mentor.	Week 5-8
Design Development	Students should use engineering design tools to develop a detailed engineering design. The design should include calculations and modeling capabilities that will predict the final outcomes of the design. The student should share the modeling and design ideas and gain feedback from their industry mentor.	Weeks 8-10
Design and Iteration 1	Students will bring their design to life and present the first initial design to their teacher and industry mentor.	Weeks 10-18
Design and Iteration 2	Students will improve their first iteration and present the second iteration to their teacher and industry mentor showing the improvements made to meet additional design criteria.	Weeks 19-21
Design and Iteration 3	Students will improve their second iteration and present the third iteration to their teacher and industry mentor showing the improvements made to meet additional design criteria.	Weeks 22-25

Refinement, Marketing and Branding	Students will refine the idea to make it a marketable and reproducible product. This includes detailed final drawings, create a budget for production, and important features of how the design makes an impact and solves a problem.	Weeks 26-30
Sales Pitch and Business Meeting	Students should develop an elevator pitch for their project, research the potential market, and develop a deeper dive into the design solution and its marketability.	Weeks 31-33
Final Presentation	Students should contact and schedule potential community members and business members to a meeting to see a demonstration of the final design idea.	Week 35