**Challenger High School 2023-2024**

Engineering Essentials

**CEDARS Course Code:** 21001 Term 1: 01/31/24 - 04/12/24

 Term 2: 04/15/24 - 06/14/24

**Teacher’s Name: Scott Birdseye Phone**: (253) 800-6822  **Email: sbirdseye@bethelsd.org**

**Grade Level:** 9, 10, 11, 12 **Credit:** Occupational/CTE, Fine Arts, or Elective 1.0 **NCAA Approved**

**District Course Code:** CTM101 **Prerequisite Courses:** None **Credits:** .5



***Course Description***: In Engineering Essentials, students explore the work of engineers and their role in the design and development of solutions to real-world problems. The course introduces students to engineering concepts that are applicable across multiple engineering disciplines and empowers them to build technical skills through the use of a variety of engineering tools, such as geographic information systems (GIS), 3-D solid modeling software, and prototyping equipment. Students learn and apply the engineering design process to develop mechanical, electronic, process, and logistical solutions to relevant problems across a variety of industry sectors, including health care, public service, and product development and manufacturing.

***Course Objective and Goals:***

This class is an introductory course designed to promote different aspects of engineering. Students will explore the design process and how it relates to all aspects of critical and creative problem solving. Following an in-depth look at the design process, students will take on the challenge of urban design and reimagining spaces from an environmental lens. At Challenger High School we believe that all students can think like an engineer and we provide opportunities and for all students to do so.

***Bethel School District Priority Standards***:

*Standards* - this course meets the State and School District graduation requirements. This course meets the Next Generation Science Standards:

**Ecosystems: Interactions, Energy, and Dynamics**

**HS.LS2.7**

Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.

**Earth and Human Activity**

**HS.ESS3.4**

Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.

**Disciplinary Core Ideas**

**ETS1.A Defining and Delimiting Engineering Problems**

* Humanity faces major global challenges today, such as the need for supplies of clean water and food or for energy sources that minimize pollution, which can be addressed through engineering. These global challenges also may have manifestations in local communities.

**ETS1.B Developing Possible Solutions**

* When evaluating solutions, it is important to take into account a range of constraints, including cost, safety, reliability, and aesthetics, and to consider social, cultural, and environmental impacts. (HS- ETS1-3)

**ETS1.C Optimizing the Design Solution**

* Criteria may need to be broken down into simpler ones that can be approached systematically, and decisions about the priority of certain criteria over others (tradeoffs) may be needed. (secondary to HS-PS1-6)

**Science and Engineering Practices**

* Practice 1 Asking Questions and Defining Problems
* Practice 2 Developing and Using Models
* Practice 3 Planning and Carrying Out Investigations
* Practice 4 Analyzing and Interpreting Data
* Practice 6 Constructing Explanations and Designing Solutions
* Practice 7 Engaging in Argument from Evidence
* Practice 8 Obtaining, Evaluating, and Communicating Information

***Teacher and Course Expectations:***

* *Daily Activities* – You are encouraged to participate in weekly activities that promote fitness and health.
* *Class Projects:* Each lesson in the course will have a final project that will act as your summative assessment for that course of learning. These projects may be either individual or group based, but your grade will be your own.
* *Grading Rubrics* – Standards based rubrics will be used to evaluate your progress on formative and summative assessments. (See Canvas for Project Rubrics).
* *ALE Progress* - Your progress is monitored weekly. Progress is at the discretion of the certificated teacher based on weekly evaluations and the students’ ability to complete the required learning benchmarks for that week. If a student fails to make collective progress, then monthly progress is unsatisfactory. Student monthly progress is specifically evaluated against progress benchmarks, which are clearly defined in the course for each week. In addition to the course schedule, these benchmarks may also come in the form of lesson, unit, assignment and/or assessment completion dates. These established progress benchmarks will allow teachers and students to assess the students’ educational progress in meeting the course learning standards. At a minimum, students must turn in at least one assignment per week to maintain a passing grade and a status of “making monthly progress,” but will need to complete all the instructor is asking for each week in order to complete the course on time.

***Grading Policy:***

***Course Grading Categories:***

* Formative Assignments will make up 30% of your grade.
* Summative Assignments will make up 70% of your grade.

***Summative Assessments:***

* Summative assessments for this course will be end of unit projects.

***Grading Scale:***

A: 100-94, A-: 93.99-90

B+ 89.99-87, B: 86.99-84, B-: 83.99-80

C+: 79.99-77, C: 76.99-74, C-: 73.99-70

D+: 69.99-67, D: 66.99-64, D-: 63.99-60

F: 59.99-0.

**Textbook Used:**

The course textbook is available online via PLTW’s website. It is accessed via the Bethel portal and Clever.

**Class Expectations:**

* No personal electronic devices out during class unless approved by teacher
* All class rules of conduct and safety adhered to
* Students will be to class on time