Sage Creek High School
Course Syllabus
Introduction to Engineering Design

PROJECT LEAD THE WAY PLTW

2025-26

Course Title

Introduction to Engineering Design –Project Lead The Way (PLTW)

Purpose of the Course

Welcome to Project Lead the Way and the Engineering Program. Project Lead the Way is a national, not-for-profit educational program that assists high-school students in developing strong backgrounds in science and engineering. The following is the link to Project Lead the Way online: http://www.pltw.org/our-programs/engineering

Students dig deep into the engineering design process, applying math, science, and engineering standards to hands-on projects. They work both individually and in teams to design solutions to a variety of problems using 3D modeling software, and use an engineering notebook to document their work.

Course Materials

Engineering Notebook
Pencil/Black Pen

Grading Scale

Points	Grade	Points	Grade
94+	A	74-76	C
90-93	A-	70-73	C-
87-89	B+	67-69	D+
84-86	B	64-66	D
80-83	B-	60-63	D-
77-79	C+	<59	F

Estimated Assignment Values

Classwork / Engineering Notebook	30%
Final	10%
Exams/Quizzes	20%
Projects	40%

Aeries/Google Classroom Expectations

Every student and parent has their own access to Aeries to monitor homework assignments, grades, and to contact teachers. It is your responsibility to check your grades and maintain an ongoing routine for checking them. Instructions, detailed assignment descriptions, and feedback are on Google Classroom.

Student Expectations .

Be your **BEST**
Establish Community
Show Respect
Take Responsibility

General Class Rules

1. Observe and practice the Golden rule.
2. Before the bell, be seated and ready with necessary materials. (Be prompt and prepared)
3. Follow directions, classroom rules, and procedures first time given. (Be responsible)
4. No gum
5. No food/ drink (except bottled water) at/near seat
6. No cell phones/ electronic gaming devices (SEE DISTRICT POLICY)
7. Music during independent class work only.
8. No hoods in class.
9. Participate fully with positive comments and actions only. (Be kind to others)
10. Raise your hand and wait to be called upon before speaking in class. (Be respectful)
11. Keep hands, feet, and objects to yourself. (Be mature).

Computer/ Internet Use

1. Used for course-related research and activities only
2. Prohibited uses of the system include
3. Damage, vandalism, piracy, or theft of equipment and software
4. Use of system for unlawful or commercial purposes or communication of personal, political, or religious views
5. Violation of copyright law
6. Plagiarism of ideas
7. Transmission of computer viruses
8. Sending or retrieving pornographic, obscene, sexist, racist, abusive, or harassing information
9. Any use violating federal, state, or district policy
10. Any conduct deemed objectionable by Sage Creek High School
11. Any social networking sites
12. No Games
13. Do not change the computer screen saver, delete, download, or install any programs or files without the instructor's permission.
14. Do not plug/unplug any cables without the instructor's permission.

Fall 2024- CUSD Cell Phone Policy-

High School: High school students may not use cell phones, smart watches, pagers, or other mobile communication devices during instructional time. Mobile communication devices shall be turned off and kept out of sight during instructional time. *Instructional time* is defined as any scheduled class period and any other time during the school day when students are expected to be engaged in a learning activity.

During non-instructional time, high school students may use cell phones, smart watches, pagers, or other mobile communication devices on campus as long as the device is utilized in accordance with law, the district Acceptable Use Agreement, and any rules that individual school sites may impose.

Violation Protocol.

First Offense: Student warning
Second Offense: Student warning, teacher contact to parent recommended, teacher/staff may take device.
Third Offense: Teacher/staff takes device to be returned to student at the end of class period, teachers contact parent, referral to office for documentation in student information system.
Fourth Offense: Device delivered by teacher/staff to office for pick up after school, contact parent, referral to office for documentation in student information system. Additional progressive discipline measures will be employed as needed.

Cell Phone Classroom Poster – High School
District Website on Cell Phone Policy

SCHS Site Recommendations-

1. Teachers should copy and paste the district's cell phone policy and violation protocol into their course syllabus.
2. If teachers already have established activities during instruction where cell phone use is permissible and necessary (ie. labs, collaborative work, fieldwork, etc) it is recommended that teachers name it and articulate it in your syllabus. Clear boundaries and expectations will be important.
3. SCHS has the comment "Excessive Cell Phone Use" already established in our grade reporting options in Aeries. Departments should be consistent about what step of the violation protocol would warrant the comments being added to the progress report.
4. **Remember the "why".** Students, like the rest of us, respond better to rules when they understand the "why" behind them. We recognize the contribution smartphone technology has made to society and the value it can add to our lives. However, we are here to help teach healthy habits and boundaries that enhance our student's ability to learn and thrive. It's encouraged to provide students with any research or resources that show the importance of balance with technology. Further reading

STUDENTS WILL PAY FOR ANY LOST, STOLEN OR DAMAGED TO EQUIPMENT IN THE FORM OF A LIBRARY FINE.

Positive Consequences

- Letters of recommendation
- Class/individual rewards

YOU WILL NOT BE ABLE TO TRANSFER OR GRADUATE UNTIL FINE IS PAID

Participation Policy

Attendance is extremely important for a number of reasons. If you have to miss a class, please inform me in writing before your next class (email is fine). It is your responsibility to inquire about the previous class activities which will be available to you online. Missing class meetings during the trimester, regardless of the reason, may have a negative effect on your class participation grade. I will allow students to make up participation if I am informed of absences before the beginning of the student's next class session. Tardies can negatively affect your participation as well, so please be seated and working before the bell rings. You cannot make-up participation points after the deadline has passed, (for tardies, it will be before the end of the class period you were late for. For absences, it will be before the beginning of your next class session) so please come to class on-time and often. No electronic devices (Cell Phones, Gaming Devices, etc.), except calculators, will be allowed at any time during the class period. If you have an electronic device, it must be turned off. When you are absent from class, it is your responsibility for finding out the missed notes and assignment(s).

Academic Assistance

Please contact the teacher to make arrangements if further assistance is needed.

Trimester A Pacing Guide: Topics & Objectives

# of Days	Learning Targets	Essential Laboratories, Projects, and/or Activities	Formative & Summative Assessment(s)
10	Unit 1: Design Process	**Activity 1.1 Instant Challenge: Cable Car** **Activity 1.2 Instant Challenge: Aerodynamic Distance** **Activity 1.3 Concept Sketching** **Activity 1.4 Product Improvement** **Activity 1.5 Deep Dive** **Design Brief Apollo 13 (Optional)**	Essential Questions Projects Assignments

		Activity 1.5a Gossamer Condor Design Brief **Activity 1.6 Discover Engineering** **Activity 1.6b Engineering and Related STEM Careers (Optional)** **Instant Challenge: Paper Bridge**	
8	Unit 2: Technical Sketching and Drawing	**Activity 2.1 Isometric Sketching** **Activity 2.2 Perspective Sketching** **Activity 2.3 Glass Box (Optional)** **Activity 2.4 Multiview Sketching** **Activity 2.5 Sketching Practice**	Portfolio
8	Unit 3: Measurement and Statistics	**Activity 3.1a Linear Measurement SI (Optional)** **Activity 3.1b Linear Measurement US (Optional)** **Activity 3.2 Unit Conversion (Optional)** **Activity 3.3 Making Linear Measurements (Optional)** **Activity 3.4 Linear Dimensions (Optional)** **Activity 3.5 Applied Statistics Class heights** **Activity 3.6 Instant Challenge Fling Machine** **Activity 3.7 Statistical Analysis with Google Sheets** **Activity 3.8 Precision Accuracy Measurement** **Activity 3.9 Statistics Quality**	Projects Essential Questions
7	Unit 4: Modeling Skills	**Activity 4.1a Puzzle Part Combinations**	Projects Portfolio

		Activity 4.1d and Activity 4.1.e - Software Modeling Introduction **Activity 4.1f Software Modeling Introduction Reference** **Activity 4.1g Model Creation** **Project 4.1 Puzzle Design Challenge** **Activity 4.2 Puzzle Cube Package (Optional)**	
5	Unit 5: Geometry of Design	**Activity 5.2a Geometric Constraints** **Activity 5.2b Introduction to CAD Modeling Skills** **Activity 5.3 Determining Density (Optional)** **Activity 5.4 Calculating Properties Solids (Optional)** **Activity 5.5a CAD Model Features Part 1** **Activity 5.5b CAD Model Features Part 2**	Projects

Trimester B Pacing Guide: Topics & Objectives

of Days	Learning Targets	Essential Laboratories, Projects, and/or Activities	Formative & Summative Assessment(s)
1	**Unit 6: Reverse Engineering Automoblox deconstruction**	**Activity 6.1 Visual Design Principles and Elements Identification** **Project 6.5 Product Reverse Engineering**	
7	**Unit 7: CAD Documentation Automoblox**	**Activity 7.1 Dimensioning Standards** **Activity 7.2 Sectional Views** **Activity 7.3 Tolerances** **Activity 7.4 Assembly Models** **Project 7.5 Engineering Documentation Automoblox**	**Projects** **Portfolios**

		Project 7.5a Engineering Documentation (Alternate) **Design Brief Apollo 13** **Problem 7.7 Automoblox Product Enhancement** **Problem 7.7a Product Improvement (optional)**	
7	**Unit 8: Advanced Computer Modeling-Automata**	**Project 8.1 CAD modeling Automata** **Cams Creation** **Cams in Motion** **Automata Physical Model** **Motion Constraints** **Interference** **Video Simulation**	**Digital Portfolio** **Physical Model**
2	**Design Challenges embedded into multiple units**	**Paper Bridge** **Paper Bridge 2.0** **Cube Piece combinations** **Cube Solving** **Fling Machine** **Wallet (Empathy)** **Air Vehicle** **Fling Machine** **Design a Game**	**Projects** **End of Course (EoC) Assessment**