Engineering Design and Development (EDD) Course Description & Syllabus

Engineering Design and Development (EDD) is the capstone course in the PLTW high school engineering program. It is an engineering research course in which students work in teams to design and develop an original solution to a valid open-ended technical problem by applying the engineering design process. The course applies and concurrently develops secondary level knowledge and skills in mathematics, science, and technology.

Students will perform research to choose, validate, and justify a technical problem. After carefully defining the problem, teams of students will design, build, and test their solution. Finally, student teams will present and defend their original solution to an outside panel. While progressing through the engineering design process, students will work closely with experts and will continually hone their organizational, communication and interpersonal skills, their creative and problem solving abilities, and their understanding of the design process.

Engineering Design and Development is a high school level course that is appropriate for 12th grade students. Since the projects on which students work can vary with student interest and the curriculum focuses on problem solving, EDD is appropriate for students who are interested in any technical career path. EDD should be taken as the final capstone PLTW course since it requires application of the knowledge and skills from the PLTW foundation courses.

The course of study includes:

* The Design Process
* Intellectual Property
* Research
* Problem Identification, Validation, and Justification
* Teamwork
* Project Management
* Design Specifications
* Concept Testing
* Design Proposal
* Virtual Solutions
* Building a Prototype
* Testing a Prototype
* Test Evaluation and Refinement
* Documentation
* Presenting the Process and Results

# Grading Breakdown:

* Engineering Notebook/Portfolio: 15%
* Daily Participation/ Effective Task Completion/ Team work/ Time management: 50%
* Task Reports/Innovation Portal: 20%
* Homework/Extended Time: 5%
* Final Presentation: 10%

## Engineering Notebook:

* Is a collection of all your work in class and should be a complete chronological record of all daily work in class. It should include:
  + Daily notes, sketches, records that you create as you work through your design project
  + Handouts from Teacher
  + Team documents (research, CAD designs, test results/data, orders, parts list, etc.)

## Task Reports/Innovation Portal:

* Task reports are focused, detailed, engineering reports that explain in complete a large task or series of tasks that have been completed by an individual/group as a major part of the yearlong project.
* The report is generally either a typed formal “lab report” that includes: procedure, materials, testing and results. This year’s alternative format will be an online documentation using the “PLTW Innovation Portal” website or google sites

## Homework/Extended time:

* While there is generally not any typical “assigned” homework (worksheet, Poster, etc.) There may often be time where it will be necessary to complete work outside of the classroom time and environment (lunches, after school, at home, weekends, vacations). This time may be group or individualized and is often put upon you to initiate (not assigned by the teacher)

## Daily Participation/ Effective Task Completion/ Team work/ Time management

* Daily Participation is your daily time and effort spent working directly on your project and tasks. You are expected to use your class time efficiently to work on EDD material. Time wasted, distracted and working on outside work will detract from this grade
* Effective task completion is your ability to be assigned a task, research it, develop it, execute it and troubleshoot it. You are expected to consult your group/timeline and move onto other tasks independently when you have finished or when a task cannot be completed at that time.
* Your ability to work effectively with your team members and to share: workloads, task types, leadership roles.
* Your ability to independently manage your in-class time by: prioritizing tasks by importance and urgency, staying focused on classwork, utilizing “shop time” and “homework” time.

## Final Presentation:

* This is a professional presentation of the completed project given to justify your yearlong design process from start to finish including highlights of: research, design, prototyping, financials, testing, competitions.
* This will be presented to a board of professionals including; principal, superintendent, local engineers, and teachers.