Honors Engineering Design and Development
Course Syllabus
Instructor: Robert Hjelle
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Plan Periods: B8
Office/Classroom Room: Curriculum Center or Engineering Office
Best times to contact: During your class period

Course Description:
Engineering Design and Development (EDD) is the capstone course in the PLTW high school engineering program. It is an open-ended engineering research course in which students work in teams to design and develop an original solution to a well-defined and justified open-ended problem by applying an engineering design process.

Students will perform research to select, define, and justify a problem. After carefully defining the design requirements and creating multiple solution approaches, teams of students select an approach, create, and test their solution prototype. 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 introduced during the PLTW foundation courses.

This course includes an innovative curriculum across English, Math, and Engineering courses to prepare students for the fundamentals of public speaking, written expression, and critical thinking in correlation to the design process. Students will engage in technical writing activities, informational reading relevant to engineering topics, and formal/informal presentations in anticipation of post-secondary education and career studies.

Instructional Philosophy
At the conclusion of this course, students will be able to take the design process learned within EDD to their college courses and beyond. Not all the solutions created in EDD will be viable beyond the scope of the class, but the process by which we reached those solutions can be used in many settings.

Content Standards
STEM principles and practices form previous PLTW courses will be used throughout the course. Students are immersed in project management and the design process each day in class. You can find a full list of standards at https://cestandards.education.ne.gov/Courses/100163_EngineeringDesign_Development.pdf
Major Units of Study
Project Management • Documenting an Engineering Design Process • Teamwork and Professional Skills • Problem Identification and Justification • Research • Intellectual Property • Design Requirements • Project Proposals • Design • Virtual Design and Testing • Preliminary Design Reviews • Prototyping • Testing a Prototype • Presenting the Process and Results

Course Expectations
• Work in and out of class to complete all coursework to a standard that each student is proud of.
• Become experts in the STEM principles and practices needed in your solution.
• Document the design process in your engineering notebook both in and out of class.
• Work collaboratively in groups to create solutions that all group members can be proud of.
• Develop your professionalism within proposal writing and presenting.
• Show professionalism when working with mentors.

Class Rules and Expectations:
• Students will come to class prepared to learn with materials needed for class.
• Student will show respect for their peers, instructor, mentors, and working environment.
• Students will follow all safety procedures.
• Students will clean the workspace each day.
• Students will complete individual assignments as individuals and group assignments as groups.

Assessment
• Course grades will be determined by lesson assignments, engineering notebook checks, written proposals, project components, and presentations.
• The course will also require participation in at least one out of class competition. Participation

OPS Secondary Grading Practices
All coursework and assessments are judged based on the level of student learning from “below basic” to “advanced.” This course will provide multiple opportunities to achieve at the “proficient” to “advanced” levels. Students are evaluated based on a proficiency scale or project rubric.

There are two types of coursework
• Formative (35% of the final grade) – Homework, In-class assignments, Notebook Checks
  Homework and in-class assignments will be given daily and are graded on performance. Writing the answers from the back of the text book is not completing your homework and will receive a score of a zero. Homework questions will be asked at the beginning of each class and students should utilize that time to fully understand each homework problem. Homework will be due for each chapter on the day of the chapter test. Quizzes will be given a few times a month. Students will be given notice to when these will occur. Students will be given chances to retake quizzes when necessary.

• Summative (65% of the final grade) – Presentations, Proposals, Papers
  Tests will be given at the end of units. Students will be given test dates a week or so in advance. Culminating Tasks will be given at different times throughout the year. These assessments are project-based.

OPS Grading Scale
A 3.26 – 4.00
B 2.51 – 3.25
C 1.76 – 2.50
D 1.01 – 1.75
F 0.00 – 1.00
**Missing Coursework:** Coursework not turned in at all will be recorded as an M for missing which calculates to a score of zero.

**Redoing/Revising Coursework:** Students may be allowed redoes and revisions of coursework for full credit during that unit of study based upon the teacher’s professional judgment and evidence collected throughout the unit. Scores for student work after retaking, revision or redoing work will not be averaged with the first attempt at coursework or assessment, but will replace the original student score. Students may only retake an exam if they have completed all coursework for the unit.

**Late Coursework:** Students are expected to complete coursework on time. Late coursework may be accepted for full credit until the end of the unit based on the teacher’s professional judgment and evidence collected throughout the unit. Accepted late work will not result in a reduction, and the M (missing) will be replaced with the score earned by the student. The teacher or school may make exceptions depending up on student circumstances (such as prolonged absences due to illness).

**Academic Integrity:** Students involved in allowing coursework to be copied or copying other’s coursework will receive a grade of zero. There will be no opportunity to redo any coursework in which a student is caught cheating.