

Providence Career & Technical Academy

Pre-Engineering III Technology Syllabus

Instructor Name: Annalisa G. Marchesseault and Amy Laven **Time Frame:** 2021-2022

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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.

Pre-Engineering III: 12th grade students will be participating in the Project Lead the Way Engineering Design and Development (EDD) curriculum this school year.

Required Textbooks, Reading and Supplementary Materials:

All materials are available through the PLTW.org website

Common Core Standards Addressed:

For a full list of standards, please visit the site below.

<https://www.pltw.org/our-programs/standards-alignment>

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Engineering Design and Development (EDD)

Common Core State Standards for English Language Arts

Component o

AS.R.1 - Reading

Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

AS.R.2 - Reading

Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.

AS.R.4 - Reading

Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.

AS.R.10 - Reading

Read and comprehend complex literary and informational texts independently and proficiently.

AS.W.1 - Writing

Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

Assignment and Examination Schedule

| Unit # | Completion Date |
|--------|-------------------------|
| 1 | End of QTR 1 |
| 2 & 3 | Middle and End of QTR 2 |
| 4 & 5 | Middle and End of QTR 3 |
| 6 | End of QTR 4 |

Assignments given daily as well as hands on projects and presentations.

Senior:

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Component 0: Project Management

- (α) – The EDD Design Process and Project Management
- (β) – Documenting the Engineering Design Process
- (γ) – Teams, Timelines, and Contacting Experts
- (δ) – Project Evaluations and Classroom Management
- (ε) – Intellectual Property

Component 1 – Research

- Element A – Identification and Justification of the Problem
- Element B – Documentation and Analysis of Prior Solution Attempts
- Element C – Presentation and Justification of Solution Requirements

Component 2 – Design

- Element D – Design Concept Generation, Analysis, and Selection
- Element E – Application of STEM Principles and Practices
- Element F – Consideration of Design Viability

Component 3 – Prototype and Test

- Element G – Construction of a Testable Prototype
- Element H – Prototype Testing and Data Collection Plan
- Element I – Testing, Data Collection, and Analysis

Component 4 – Evaluation of Project and Process

- Element J – Documentation of External Evaluation
- Element K – Reflection on the Design Project
- Element L – Presentation of Designer's Recommendations

Component 5 – Reflection and Presenting the Design Process

- Element M – Presentation of the Project and Project Portfolio
- Element N – Writing Like an Engineer

Component 6 – Going Beyond EDD

Component 0 – Project Management

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Major focuses of the course are project management and professional skills required to successfully complete and document an engineering design process. Topics student will study and skills they will refine are:

- (α) – The EDD Design Process and Project Management
- (β) – Documenting the Engineering Design Process
- (γ) – Teams, Timelines, and Contacting Experts
- (δ) – Project Evaluations and Classroom Management
- (ε) – Intellectual Property

Grading Policy:

Students are encouraged to come to class prepared, and participate in all class activities. However in an effort to measure students true knowledge only assessments will be used to calculate the score of all students.

| Category | Percentage, % |
|---------------|---------------|
| Participation | 10 |
| Class Work | 50 |
| Notebooks | 10 |
| Presentation | 20 |
| Exams | 10 |

EXPECTATIONS:

Safety

We expect all students to thoroughly understand and observe any and all possible safety issues inside and outside the classroom. Students will be using power tools and will be soldering for various assignments.

Effort and Class Participation

We expect all students to give 100% and always try their hardest. This will be demonstrated through daily active participation on all assignments.

Conduct

We expect all students to adhere to the school's handbook regarding classroom conduct. We believe a student performs at their best in a comfortable, safe environment on the physical and emotional levels. Teasing, bullying, hurtful and disrespectful behavior will NOT be tolerated.

Prior to RTII

1. The pre-engineering department shall identify on a monthly basis any student who has

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frequent absences, several missed assignments or failing assignments, and a lack of effort within the classroom and lab.

2. The first step once any students have been identified will be a meeting with the student to discuss the students' performance. In the case of necessity guidance and the director of CTE will be notified and met with to evaluate the student's lack of performance. This meeting will allow the student and instructor time to produce a comprehensive plan with the help of a guidance counselor and the CTE director to get the student to the appropriate performance level. This gives the student the opportunity to be a part of his or her education and be part of the plan that will help them to get back on track within the class. During the time of this meeting a time period will be set in which all missing work must be completed.

3. In the case that the student does not follow through and complete the work within the time period set in meeting one, a second meeting will take place. Within the second meeting the student, pre-engineering teacher, CTE director, guidance counselor and the parents/guardians of the students will attend.

4. If student performance continues to decline the student will be referred to RTII (see below for RTII plan)

RTII Plan

1. The pre-engineering department will meet once a month to discuss any potential students who are in the "at risk" category. The "at risk" category is defined as any freshmen or sophomore student missing more than 22 days in one quarter, also any student who fails one full module from the curriculum. The above will apply to juniors and seniors with the exception of if the student misses 11 days or more per a quarter.

2. Once any "at risk" students have been identified a spreadsheet shall be forwarded to guidance and special education. The spread sheet will be filed permanently in the electrical department.

3. A meeting shall be scheduled with the RTII team to discuss further actions to create a comprehensive plan for the student's to succeed.

4. Upon the student's completion of RTII the Pre-Engineering department shall contact the RTII team to discuss whether the student shall be referred to special education or if they can be dismissed from the Intervention plan.