

Engineering Design & Development (EDD)

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2018-2019 Course Syllabus

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COURSE DESCRIPTION: This course, designed by *Project Lead The Way*, provides students with an opportunity to be their own ‘boss’ as it pertains to the design and construction of a device that is intended to solve a problem, a problem derived from the 1st-person experience of the students. Students will become well-versed in the engineering design process, and are required to rigorously maintain an individual engineering notebook. Student design teams will present their design process and results to a panel of engineering professionals in mid-December. For further research into PLTW Engineering, right-click on; <https://www.pltw.org/our-programs/pltw-engineering>

INSTRUCTIONAL PHILOSOPHY: EDD is an open-ended course. In short, it is YOUR project and your instructor is more like your BOSS, as opposed to your teacher. Each design team will have a Team Lead who will report to Dr. Rutherford on a weekly basis as to the progress on your design project. You will be expected to present numerous times to your peers throughout the semester prior to the final presentation in December. Communication both written and oral, are a key aspect to a successful career.

ESSENTIAL STANDARDS:

1. *Student will be able to identify and write the PLTW prescribed twelve engineering design processes.*
2. *Students, in their design teams, will develop a problem statement based upon 1st-hand life experiences that is intended to address/solve the team’s chosen problem.*
3. *Students will conduct the necessary research in order to ascertain the need for and the existence of solutions to their problem that may already be in the public domain.*
4. *Once a particular solution has been decided upon, and data has been collected and analyzed, student design teams will develop a series of product specifications pertaining to their problem solution.*
5. *Students, in their engineering notebooks, will provide detailed sketches and diagrams of their design solution. These will be updated as necessary.*
6. *Students will submit a technical paper providing all requisite information regarding their design process and solution.*
7. *Students, during the construction phase, will abide by all requisite safety procedures, both on and off –site.*
8. *Students will present their project design to a panel of local engineering professionals.*
9. *Students will research, present, and submit a formal paper on an engineering disaster.*

MAJOR ASSIGNMENTS/PROJECTS:

1. *Engineering notebook: This is an ongoing project item to be maintained throughout the design project process. It will be assessed on a regular, unannounced basis.*
2. *Engineering disaster project: Student, by random selection, will research, submit a formal paper, and present to their peers.*
3. *Engineering design project: This is the emphasis of the entire course. Students, in their design teams, will formulate a problem statement, and follow through on the engineering design process culminating in a constructed device, formal paper, and final presentation to a panel of local engineering professionals.*

ASSESSMENT PLAN: *The primary method of assessment will be via your engineering notebook. Throughout the semester, there will be numerous and varied other sources of assessment both formative (daily) and summative (final paper and presentation).*

DAILY CLASSROOM FORMAT: Each class will convene precisely at 0755/1150. When the tardy-bell rings, students are to be seated, paper and pencil ready to undergo the daily opener. The daily openers are quizzes comprised primarily of mathematics covering a variety of disciplines throughout the semester. These are, Algebra, Geometry, Trigonometry, and Statistics. The student is expected to already be familiar with all of these mathematical disciplines. Your instructor will provide any review on these disciplines and their sub-topics at his discretion. Daily openers will typically be of 10-15 minutes in length and will be assessed on-the-spot by the students or another student, or your instructor if he sees the need to look at them personally which he does anyway prior to entering into Power School. Following the opener, students will typically gather into their Design Teams once various topics are sufficiently covered by the instructor throughout the semester. The last 2-5 minutes of the class will have the instructor projecting a *closer* to be taken home and solved. Each daily closer will be due in the AM/PM Inbox BEFORE the tardy bell rings. Should your closer not be in place at the tardy bell, it will be counted as a zero regardless of whether you solved it.

POST-SECONDARY RECOGNITION OF PLTW/EDD

The following post-secondary institutions provide opportunities for those students completing a series of PLTW courses;

- **Missouri S&T(Rolla):** <http://pltw.mst.edu/index.html>
- **University of Missouri-Columbia:** <http://engineering.missouri.edu/scholarships/>
- **University of Kansas:**
<http://www.engr.ku.edu/prospective/undergraduate/scholarships/>

GRADING POLICY: *Grades will be figured using the Summit Technology Academy approved grading scale. Grades are cumulative throughout the semester. Semester (A1) grades are computed as per the following weighted grading system:*

1. *EDD homework: 35%*
2. *Exams/Notebooks: 55%*
3. *Quizzes: 10%*

The students Final Exam is their design team presentation in mid-December. It is weighted 20% of the semester grade.

Note: *Any assignment, be it a paper, quiz, etc., that is not turned in (hard copy and/or email) as per the due date and time or as prescribed in this syllabus will receive a ZERO! In short, late anything will simply not be tolerated.*

The following standardized grading scale is used for STA:

A = 95 -100	C = 73 - 76
A- = 90 - 94	C- = 70 - 72
B+ = 87 - 89	D+ = 67 - 69
B = 83 - 86	D = 63 - 66
B- = 80 - 82	D- = 60 - 62
C+ = 77 - 79	F = 59 & below (No Credit)

Note: A grade of C- or below will bring into question whether or not a student is fit for the Spring Semester *Engineering Field Experiences (EFE)*. **TUTORING/EXTRA HELP PLAN:** STA utilizes a pyramid of interventions in order to increase the likelihood that students successfully meet the course requirements. Tutoring or extra help can be obtained by contacting the STA teacher through e-mail, phone or a student management system (such as Blackboard or Canvas). The teacher will provide either immediate help, set up a time to meet, or utilize an online video conference method.

ATTENDANCE POLICY: Regular attendance reflects dependability. The experience gained by student design teams is of paramount importance. **Summit Technology Academy's policy may differ from that of the home school and will be in effect for the period of attendance at STA.**

A student shall be allowed no more than nine (9) absences, excused or unexcused, per semester in any one class. When a student reaches 9 days, the school will send an informational letter to the parents, regardless of prior contact by phone or conference. The letter serves as notification of the number and type of absences by the student in each class. On the tenth (10) absence, in any one class, the student will not earn credit for that class. Students will have the opportunity to work with their administrator or teacher to make up missed time prior to the end of the semester. If a student still has 10 or more absences at the conclusion of the semester, the student will be required to complete an attendance waiver appeal. A waiver to maintain full credit must be submitted by the end of the semester. This waiver should include documentation of illness, funeral, or family emergency from a medical doctor, dentist, minister, or other official source. The waiver should be turned into the attendance office.

ELECTRONIC GRADEBOOK/PARENT CONNECT WEBSITE: Grades are updated on a weekly basis. The Parent Connect website address is <http://pc.leesummit.k12.mo.us>

ACADEMIC LETTERING: Any student who has maintained a 4.0 GPA for both semesters of the STA course will receive an academic letter.

ADDEMDUM TO COURSE SYLLABUS

TARDY POLICY: *A tardy will be issued in accordance with the student handbook. Students are on time if they are seated in the classroom at 0755/1150, not simply walking through the classroom door. A tardy will result in a “0” on any daily opening activity/quiz. Take care of water-drinking and restroom needs BEFORE the class begins.*

DRIVING PRIVILEGES: *Driving to STA is a privilege and can be revoked at any time. Students are allowed to drive to STA as long as their sending school allows them to drive and a permit is on file. Driving permits may be revoked if a student is frequently tardy, late to school, or exhibits irresponsible driving practices upon entering, or leaving STA, etc.*

ELECTRONICS POLICY: *No electronics or headphones are allowed in the classroom unless being used in the educational process or as directed by the instructor. Electronics should be placed in backpacks or purses and out of sight. Students are encouraged to interact and help one another when appropriate.*

DAILY MATERIALS NEEDED:

1. Engineering notebook: 1st notebook will be provided by STA.
2. Mathematics notebook: This is to be provided by the student. Like the engineering notebook, it will be a *composition-style* notebook. Students will compile any and all mathematical work in this notebook.
3. 1, 2 or 3-inch, 3-ring binder with a transparent cover slip.
4. Scientific calculator.
5. Pencil(s) and pen(s)(Black and/or blue).
6. At a minimum, 2-4G flash drive.

TECHNOLOGY: *Students are required to utilize technology for various assignments. It is understood that not all students will have home access to personal computers. Computers are available at your home high schools, and the public library. Your instructor will not tolerate, “I didn’t have access to a computer.”, or “My computer crashed.”, or “I can’t find my flash drive.”, or “I left my flash drive at home.”, blah, blah, blah, etc. It is wise to backup all coursework in multiple locations. Catch my drift!?*

Note: Yes, cell phones are, by definition, “technology”. Yet, using your cell phone during formal instruction **WILL NOT BE TOLERATED**. There will be occasions when you need to contact a professional, etc., yet this is to occur when you are with your team and working on your design project or perhaps during a team break.

Your instructor wishes success and a satisfying Fall Semester. Yet, that in-a-large-part will be up to you and how aggressively you attack this course. Throughout your engineering school experience, again, your level of success will be largely dependent upon you. You will have some highly effective instructors, and you will have those who will make it painfully obvious that they have ZERO desire to teach. Well, you’ll simply have to deal with it the best that you can and strive to succeed, regardless. TRUST ME ON THIS. My objective in EDD and EFE is to provide you an opportunity to be ready to tackle any situation regardless of the instructional circumstances that you find yourself in. Put quite simply....,

I TAKE NO PRISONERS ..., FOR YOUR SAKE

