

Engineering Syllabus

OHHS CTE Department



Engineering Design

Course Code: CTO12E/CTO12F

Course Description:

A project based introduction to engineering analysis, problem solving, and mathematical modeling. Working in teams, students will complete a series of hands-on projects designed to emphasize a systematic, analytical problem solving approach and explore the engineering disciplines at a technical level. Topics include introductory engineering concepts; engineering for sustainability; teamwork skills; the application of mathematics, physics, and chemistry in engineering; unit systems; and an introduction to spreadsheet applications.

Prerequisites

None

Class Website:

The class website can be easily navigated to via the OHHS Website, with the physical URL listed below. However, all assignments, documents, syllabi, and important information will be available on Google Classroom.

<https://www.ohsd.net/Domain/1720>

Google Classroom Codes:

Section 1: vy08dul

Section 2: 2bbqiz

Section 3: n4qgf3u

Course Fees

None

Course Outline/Instructional Units

- Engineering Drafting, Layout, 3D Printing
 - Students will use CAD programs to help complete assignments.

- Students will learn current 3D modeling practices
 - Students will learn conceptualization process
 - Students will learn about 3D printing and conceptual modelling
 - Students will learn about animations and digital model testing
- Tool Safety
 - Students will learn basic lab/shop safety
 - Students will learn basic equipment safety
 - How to safely operate most wood working machinery
- Basic Robotics
 - Students will learn robotic function and processes
 - Students will learn purpose and function of robotic systems
- Structural Engineering
 - Students will learn statics, trigonometry, and arithmetic requirements
 - Students will learn stresses involved, and how to compute breaking forces
- Mechanical Engineering
 - Students will learn mechanical processes involved in simple machines
- Biofuels/Green Engineering
 - Students will learn future and current alternative fuels
 - Students will learn green power systems and sustainable engineering
- Power Systems
 - Students will learn about future and current power systems
 - Students will learn about internal combustion engines
- Electronics
 - Students will learn basic electricity, function, safety, and values involved

Course Objectives:

- Demonstrate knowledge of safety of tools used in building processes.
- Use estimation to make order of magnitude calculations in the absence of data.
- Properly apply the rules for handling significant figures in arithmetic.
- Perform dimensional and unit analysis.
- Manipulate formulas to perform sensitivity analysis of systems to changes in one or more variables.
- Prepare and interpret graphs following accepted standards in engineering and science.
- Perform introductory spreadsheet calculations such as cell-reference equations, descriptive statistics, and graphing.
- Participate in developing functional project teams.
- Communicate technical information in a clear, concise, and accurate fashion through both written and oral presentation.
- Produce effective visual aids for oral presentations.
- Demonstrate application of the engineering problem solving processes.
- Describe elements of the engineering design process.

Rules, Policies, and Expectations:

- Respect is key; you respect me and my possessions, and I will do the same to you.
- Cell phones
 - When seen, student will be asked to put away
 - If seen more than once, student will be asked to surrender phone
 - If student refuses to cooperate, appropriate administrative action will be taken.
- Tardies
 - First tardy is a warning, second will result in lunch detention
 - Multiple tardies will result in appropriate administrative action
- Students are expected to dress in appropriate professional school attire
 - Must wear protective clothing to abide by safety practices
- Bathrooms; each student will be allowed 5 trips to the bathroom per semester.
- Students are given participation points when in lab.
 - Students are expected to work the entire period, and are expected to help clean up at the end to earn full participation points per day.
 - During lab weeks, students are graded upon grading rubric posted on website.
- Swearing will not be tolerated; this is a professional atmosphere. If a student is heard swearing, appropriate consequences will be taken.
- Disobedience, laziness, and disregard for safety will not be tolerated. Students will be given one warning. If the undesirable action continues, student will be removed from the classroom and have a talk with the teacher. Depending on severity of infraction, other appropriate disciplinary actions may be taken.
- NO STUDENT WILL BE ALLOWED TO LEAVE THE CLASSROOM OR SHOP UNTIL SAID AREA IS CLEAN TO MY EXPECTATIONS.

Major Assessments

- Major assessments will be conducted through project based learning projects. Upon completion of major projects, students will receive a grade equal or greater to a major assessment.

Extra Help

- Students are able receive extra help and work every day before and after school for a minimum of 30 minutes, often times longer. Students will also be able to come in to work on projects during designated ‘open shop’ times in the evening as indicated by instructor.

Redo Policy:

OHHS is an effort based school where we believe all students can learn. We also know that students learn at different rates. Thus, we are implementing a re-do policy that recognizes the needs of individual learners.

- 100% Re-do
 - Assessments (with exception of the Final semester exam)
 - Key Assignments: Evidence that demonstrates mastery of a standard
- All assignments are accepted after due date at a reduced score.

Grading

- Work Load Percentage Breakdown
 - Professionalism/Work Ethic - 10%
 - Readings - 10%
 - Research/Tutorials - 15%
 - Projects - 65%
 - Final - 5%
- Grading Breakdown
 - 93-100 % A
 - 90-92.9 % A-
 - 87-89.9 % B+
 - 84-86.9 % B
 - 80-83.9 % B-
 - 77-79.9 % C+
 - 74-76.9 % C
 - 70-73.9 % C-
 - 67-69.9 % D+
 - 60-66.9 % D
 - 0-59.9 % F
- When in the lab, students are graded on effort, professionalism, and cleanliness of shop.
 - Students earn 10 points a day
 - Five points for professionalism/work ethic, Five for cleaning
 - Students earn 50 points a week on a 5 day work week
 - Grading as per rubric.
- Assignments and information
 - Students will have access to the class website, and are expected to access the site for assignment outlines and rubrics.
 - The class website will contain assignments, project outlines, and rubrics.
 - Students will have access to the website at any time from any internet connected computer.
- Students are graded on individual projects.
 - Individual projects are graded upon accuracy of project, sturdiness of project, and overall fit and finish of project.
 - Assignments on paper are graded upon accuracy and students' ability to proficiently complete the assignment and follow set protocol for assignment.

- Assignments will be accompanied by grading rubric either attached or available online
- Students are expected to complete projects and class work on time. For every day a project or work is late, 10% will be deducted from the score. Exceptions will be made for excused absences. Unexcused absence will need to be made up.
- Attendance
 - Attendance is a very important aspect of this class. In order to become a functional employee/student you must be in attendance. You will be allowed to make up absence on your own time.
 - Attendance will affect your grade as described below:
 - 0-3 Absences, Grade will stay the same
 - 4-6 Absences, Grade will drop ONE (1) letter grade
 - 7-9 Absences, Grade will drop TWO (2) letter grades
 - 10+ Absences, Grade is an F unless time is made up to below 10
 - 2 Tardies = 1 Absence
 - Excused/Unexcused Absences
 - Only school activities (sports, clubs, etc.) will NOT count towards total absences
 - All other absences (illness, doctor, etc.) excused or not, will count towards total semester absences.
 - If the student is absent during lab time, they will be denied the 10 points allotted per day. Students are permitted to make up the time lost prior to or after school within a week of the absence(s).
 - If a student has an excused absence when a project is due, they have the amount of days absent to hand-in the project for full credit (i.e., if a student is gone Monday and Tuesday, their project is due Thursday).

Professionalism Grade is earned by:

- Be Here
- Be On time – Arrive to class before the last bell stops ringing.
- Be Prepared– Project out, safety goggles on, clothing for work is safe - no open toed shoes...
- Be On Task - working during period, conversations are on topic
- Be Respectful – listen during instruction, use positive comments when speaking with peers, word questions and comments appropriately during discussions

Suggested items to bring

- While students are not required to bring the following items, it is highly recommended that they do. They will have the option of checking out a locker in the lab to secure their items in.
 - Their own safety glasses with name on them
 - USB/Jump drive, at least 2GB
 - Highly recommended for backing up files
 - Gloves for handling raw materials

OHHS PLAGIARISM POLICY:

Any student, who knowingly turns in any work that has been done by someone other than himself or herself, and fraudulently represents it as his/her own, shall be considered to have cheated. Cheating also includes: aiding someone else in cheating, the use or preparation of written, pictorial, electronic or other materials not authorized by the instructor during a test or assignment, the use of testing materials obtained previous to the test date, or plagiarism of any kind. Students found cheating will also be subject to an office referral, which could result in a suspension. As an effort based school, students who have plagiarized/cheated must still demonstrate their learning. Thus, students will be given the opportunity to complete the work. This will fall under the “Late Work Policy” of the teacher where total possible points may be reduced.

Engineering Signed Syllabi
Oak Harbor High School
Instructor: Chris Whiteman

Print Student Name:

Parent/Guardian Signature:
