

Introduction to Engineering Design



Berean Christian High School

Instructor: Mrs. Sandra Hollenbeck, P.E., M.A.

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Department	STEM (Science-Technology-Engineering & Math)	Room B-6 First & Second Period
Course Description	<p>Introduction to Engineering Design (IED) is a high school level course that is appropriate for students who are interested in design and engineering or another technical career. The major focus of the IED course is to expose students to a design process, professional communication and collaboration methods, design ethics, and technical documentation. IED gives students the opportunity to develop skills in research and analysis, teamwork, technical writing, engineering graphics, and problem solving through activity-, project-, and problem-based (APPB) learning. Used in combination with a teaming approach, APPB-learning challenges students to continually hone their interpersonal skills and creative abilities while applying math, science, and technology knowledge learned in other courses to solve engineering design problems and communicate their solutions.</p> <p>In addition, students will use industry standard 3D solid modeling software to facilitate the design and documentation of their solutions to design problems and challenges.</p>	<p><i>“Do your best to present yourself to God as one approved, a worker who does not need to be ashamed and who correctly handles the word of truth.”</i></p> <p><i>2 Timothy 2:15</i></p>
Primary Objectives	<ul style="list-style-type: none"> • Become familiar with the design process and learn creative approaches to problem solving. • Learn freehand sketch techniques to assist in creating and conveying design concepts • Become familiar with industry acceptable documentation and drawing standards • Become able to create 3D modeling parts, assemblies and technical drawings through the use of Autodesk <i>Inventor</i> software • Become proficient in record keeping through the use of an Engineering Journal • Gain experience in public speaking through the task of concisely presenting individual design solutions to a panel of peers and others • Exercise practical application of mathematical skills through the use of statistics, measurement and unit conversion exercises. 	

Textbook/ Software	<ul style="list-style-type: none"> • <i>Project Lead The Way Curriculum, 2019-2020, mypltw.org</i> • <i>Introduction to Engineering</i>, Karsnitz, O'Brien & Hutchinson, Delmar Cengage Learning, 2008; ISBN: 0-471-05920 • AutoDesk Inventor Professional 2017 * <p>*A laptop and all required software will be provided for classroom use. If desired, students may also access the software on their personal computers at home. A dedicated graphics card is needed.</p>
Major Topics Covered by Quarter (projected schedule)	<p>First Quarter:</p> <ul style="list-style-type: none"> • Design Process • Technical Sketching and Drawing • Engineering Documentation and Drawing Standards <p>Second Quarter:</p> <ul style="list-style-type: none"> • Measurement and Statistical Analysis • Applied Geometry • 3D CAD Solid Modeling <p>Third Quarter:</p> <ul style="list-style-type: none"> • Reverse Engineering • Product Design <p>Fourth Quarter:</p> <ul style="list-style-type: none"> • Engineering Ethics • Virtual Design Teams • Presentation Design and Delivery

<p>Method of Evaluation</p>	<ul style="list-style-type: none"> • Grading is based on a total points system. Points will be awarded for the following: <ul style="list-style-type: none"> ○ Major Projects and Assignments 50% ○ Activities, Classwork, Participation*, Engineering Notebook, Homework 40% ○ Quizzes and Tests 10% ○ The semester grade is 40% from each quarter and 20% from the final exam. • Course resources and assignments will be provided through Google Classroom, which should be checked daily. Most homework will be submitted in Google Classroom. • Assignment due dates and times will be stated in Google Classroom. Late work will be marked down 10% for each day late. • If students have an excused absence, they must document the dates of their absence when submitting late work to avoid the late penalty. • Students are expected to take the End of Course exam and may receive college credit for doing well (extra fee required for college credit).
<p>*Participation</p>	<p>It is essential that all students have the opportunity to learn.</p> <p>Students will receive 4 classwork points per day, 2 for listening and 2 for participation. If a student does not listen quietly or talks to others when the instructor is speaking, he or she will lose one listening point. If a student is not actively following directions and involved in all assigned tasks, he or she will lose one participation point. If additional points are lost, the policies and procedures described in the “Code of Conduct” section of the Berean Student-Parent Handbook (pages 19 – 27) will be applied , including demerits.</p>
<p>Introduction to Engineering Design Class Rules</p>	<p style="text-align: center;"><i>“Honor one another above yourselves.”</i> Romans 12:10b</p> <p style="text-align: center;">These rules are designed to protect your freedom and the freedom of your classmates to learn.</p> <ul style="list-style-type: none"> • Listen and follow directions. • Raise your hand during lessons. • Respect your classmates and your teacher. • Keep your hands, feet, and objects to yourself.

<p>IED Class Procedures</p>	<ol style="list-style-type: none"> 1. Turn your cell phone off or silence it and place it in the assigned phone pocket as you enter the classroom. 2. Be in your assigned seat when the bell rings. 3. Keep your iPad off and put away or face down unless otherwise instructed. 4. Join Apple Classroom when your iPad is in use and keep the “Allow Teacher To” settings to “Always” for “Lock Apps and Device” and “AirPlay and View Screen.” 5. Store your backpack in the back of the classroom or on the floor near your feet. 6. Follow all safety procedures, clean up and put away all equipment when your work is finished. 7. Wait in your seats until you are dismissed. <p>Note: All policies and procedures contained in the Berean Student-Parent Handbook apply. Rules, procedures and/or expectations may be modified at the teacher’s discretion during the school year.</p> <p style="text-align: center;"><i>“Only conduct yourselves in a manner worthy of the gospel of Christ, so that whether I come and see you or remain absent, I will hear of you that you are standing firm in one spirit, with one mind striving together for the faith of the gospel;”</i></p> <p style="text-align: center;">Philippians 1:27</p>
<p>IED Student Expectations/ Responsibilities</p>	<ul style="list-style-type: none"> • <u><i>Do your work SAFELY, or don’t do it at all.</i></u> Students will be required to pass safety tests for all tools used in the course and must receive permission from the instructor BEFORE handling the tools. Students who choose to behave in an unsafe manner (rough-housing, not listening or following directions, etc.) may be dismissed from the course. • Do your work excellently. (Colossians 3:23, “Whatever you do, work at it with all your heart, as working for the Lord..”) • Be prepared with all materials, including: <ul style="list-style-type: none"> ○ Fully-charged iPad. ○ Engineering Notebook (provided). ○ 3-ring Engineering Binder (1.5”) ○ Scientific or graphing calculator. • Use care and respect for the computers and other equipment. Mistreatment may result in your lost opportunity to use them, which will adversely affect your grade. • Participate actively and positively throughout the class. • Maintain a complete engineering notebook and binder • Ask if you need help! I will normally be available on Mondays, Tuesdays & Thursdays from 3:05 to 4:00 p.m., or by appointment. The best way to reach me outside of school hours is via Google classroom or e-mail: shollenbeck@bereanchristian.com .

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INTRODUCTION TO ENGINEERING DESIGN – Course Outline 2019-2020

Mrs. Hollenbeck

“Do your best to present yourself to God as one approved, a worker who does not need to be ashamed and who correctly handles the word of truth.”
2 Timothy 2:15

I have read and understand the INTRODUCTION TO ENGINEERING DESIGN Course Outline for 2019-2020.
I understand that SAFETY is a high priority, and I will abide by all safety rules and instructions.
(Please e-mail me, shollenbeck@BereanChristian.com if you have any questions.)

Student Name (printed):

Date:

Student Signature:

Class Period:

I have read and understand the INTRODUCTION TO ENGINEERING DESIGN Course Outline for 2019-2020.
My student and I understand that SAFETY is a high priority, and my student will abide by all safety rules and instructions.
(Please e-mail me, shollenbeck@BereanChristian.com if you have any questions.)

Parent or Guardian Name (printed):

Date:

Parent or Guardian Signature:

(Optional) Parent or Guardian Name (printed):

Date:

Parent or Guardian Signature:
