Introduction to Engineering Design

COURSE SYLLABUS

INSTRUCTOR: Mr. Baker

CLASS LOCATION: Room 118

OFFICE HOURS: 8:30 - 5:00 Mon. & Wed. 08:30 – 03:30, Fri.

OFFICE PHONE: 753-7377 Ext. 4300

E-MAIL ADDRESS: jbaker@intechchs.org

COURSE WEB PAGE: http://www.intechengineering.org

A. COURSE DESCRIPTION

Introduction to Engineering Design™ (IED) is a high school level course that is appropriate for 9th or 10th grade students who are interested in design and engineering. The major focus of the IED course is to expose students to design process, engineering standards, research and analysis, technical documentation, global and human impacts, communication methods, and teamwork. IED gives students the opportunity to develop skills and understanding of course concepts 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, creative abilities and understanding of the design process. It also allows students to develop strategies to enable and direct their own learning, which is the ultimate goal of education.

The course assumes no previous knowledge, but students should be concurrently enrolled in college preparatory mathematics and science. Students will employ engineering and scientific concepts in the solution of engineering design problems. In addition, students use a state of the art 3D solid modeling design software package to help them design solutions to solve proposed problems. Students will develop problem-solving skills and apply their knowledge of research and design to create solutions to various challenges that increase in difficulty throughout the course. Students will also learn how to document their work, and communicate their solutions to their peers and members of the professional community.

Introduction to Engineering Design™ is one of three foundation courses in the Project Lead The Way® high school pre-engineering program. The course applies and concurrently develops secondary level knowledge and skills in mathematics, science, and technology.

B. METHOD OF INSTRUCTION

This is a lecture-lab course in which topics are presented by the instructor. Projects are explained and assigned, and are to be completed during lab periods and outside of class as needed. Students are required to maintain an Engineer's Notebook and Portfolio throughout the course with periodic checks. Objective quizzes will be given randomly, and there is a comprehensive final exam. The course is a prerequisite for the senior level Engineering Design and Development (EDD) course.

C. COURSE OBJECTIVES

• *Introduction to a design process*. Students learn about the types of design processes and how they are used.
• *Introduction to Technical Sketching and Drawing*. Students learn how to create and use technical sketches to communicate design ideas.
• *Design Exercises*. Students will learn how to use 3D modeling software to design and document various objects and problems.
• *Reverse Engineering*. Students learn how to employ the skills from previous units to reverse engineer a system, product or process to make improvements.
• *Open Ended Design Problems*. Students will be given design problems without a "right" answer set for each problem. Students will be responsible for coming up with a solution that would be considered to be "good" by society (their classmates).

D. COURSE TOPICS/UNITS (All times are tentative)

Unit 1: Design Process (10 weeks)
Unit 2: Design Exercises (10 weeks)
Unit 3: Reverse Engineering (11 weeks)
Unit 4: Open-Ended Design Problems (8 weeks)

E. REQUIRED SUPPLIES

- One (1) 2" Three Ring Binder for handouts and portfolio
- Blue or Black regular ball point pens (No felt-tip or gel pens)
- 3" X 5" note cards for test notes

F. GRADING PLAN

- Homework = 25%
- Bell Ringers = 10%
- Professionalism = 10%
- Projects = 30%
- Tests = 25%

The grading scheme will be as follows:

A	A-	B+	B	B-	C+	C	C-	D+	D	F
93%	90%	87%	83%	80%	77%	73%	70%	67%	63%	<63%

A full year average percentage of 63% or greater is required to pass this course for credit on a High School transcript.

G. COURSE SPECIFICS

- For all papers to be written, the following formatting standards apply:
  - 12 point Arial or Times New Roman font only. Arial is preferred.
  - Double space only. No other spacing will be accepted.
  - Top and bottom margins are to be 1" (one inch) only.
  - Left and Right margins are to be 1" to 1.25" only.
  - Students may use a 3" x 5" note card (handwritten, single-sided) for each in class exam. Note cards will be turned in with the test. If a student misses a test because of an exempt or excused absence, the test may be made up the next day.
  - All assignments will lose twenty-five percent (25%) if turned in late and will receive a zero percent (0%) if more than five class days late.

H. CLASSROOM RULES OF CONDUCT

- SAFETY -- Students will **ALWAYS** follow all safety rules as outlined in the safety test. Violation of any safety rule will result in termination of lab usage until a three page safety report is submitted and presented to the class.
- RESPECT -- Students will respect one another, themselves and the teacher by their actions, words and expressions. Students will respect others when they are teaching or sharing by giving them their attention.
- HONOR -- Students will honor other people's ideas and feelings. Students will honor the rules of the school.

I. ATTTENDANCE POLICY

- LATE – Students will be in their seats by the late bell. Students not in their seats will be considered tardy which will be recorded in the school records.
- ABSENT – Students who have an unexcused absence will have their assignments, tests, and labs considered late under assignment policy. Excused absences have two (2) class days to make up missing work.

J. AFFIDAVIT

- See following page.

Introduction to Engineering Design Syllabus Affidavit

My signature below indicates that I have read and understand this syllabus and have been given instructions on where to locate additional copies online.

Student Printed Name

Student Signature

Parent Printed Name

Parent Signature

Please sign and return to the instructor.