

Principles of Engineering

# COURSE SYLLABUS

INSTRUCTOR: Mr. Baker

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CLASS LOCATION: Room 118

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

OFFICE PHONE: 753-7377 Ext. 4300      HOME PHONE: 563-6689

E-MAIL ADDRESS: [jbaker@intechchs.org](mailto:jbaker@intechchs.org)

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

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## A. COURSE DESCRIPTION

**Principles of Engineering** - A course that helps students understand the field of engineering/engineering technology. Exploring various technology systems and manufacturing processes help students learn how engineers and technicians use math, science and technology in an engineering problem solving process to benefit people. The course also includes concerns about social and political consequences of technological change.

## 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. There is a comprehensive final exam given at the end of the school year in May. The course is a prerequisite for the senior level Engineering Design and Development (EDD) course.

## C. COURSE OBJECTIVES

- *Overview and Perspective of Engineering.* Students learn about the types of engineers and their contributions to society.
- *Design Process.* Students learn about problem solving and how products are developed to include how engineers work in teams.
- *Communication and Documentation.* Students collect and categorize data, produce graphic representations, keep an engineer's notebook and make written and oral presentations.
- *Engineering Systems.* Students learn about mechanical, electrical, fluid, pneumatic and control systems.

C. COURSE OBJECTIVES CONTINUED

- *Statics*. Students learn about measurement, scalars and vectors, equilibrium, structural analysis, and strength of materials.
- *Materials and Materials Testing*. Students learn the categories and properties of materials, how materials are shaped and joined, and material testing.
- *Thermodynamics*. Students will learn about units and forms of energy, energy conversion, cycles, efficiency and energy loss, and conservation techniques.
- *Engineering for Quality and Reliability*. Students will use precision measurement tools to gather and apply statistics for quality and process control. Students will also learn about reliability, redundancy, risk analysis, factors of safety, and liability and ethics.
- *Dynamics*. Students will be introduced to linear and trajectory motion.

D. COURSE TOPICS/UNITS

**Unit 1: Definition and Types of Engineering**

**Unit 2: Communication and Documentation**

**Unit 3: Design Process**

**Unit 4: Engineering Systems**

**4.1 Mechanisms**

**4.2 Thermodynamics**

**4.3 Fluid Systems**

**4.4 Electrical Systems**

**4.5 Control Systems**

**Unit 5: Statics and Strength of Materials**

**Unit 6: Materials and Materials Testing in Engineering**

**Unit 7: Engineering for Reliability**

**Unit 8: Introduction to Dynamics/Kinematics**

E. REQUIRED SUPPLIES

- One (1) 1 1/2 Three Ring Binder for handouts and portfolio if you don't have one from a previous PLTW course.
- 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 8.5" x 11" sheet of notes (handwritten, single-sided) for use on the final exam. Notes 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.

#### H. CLASSROOM RULES OF CONDUCT

- SAFETY -- Students will **ALWAYS** follow all safety rules. Violation of any safety rule will result in a three page safety report to be 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. ATTENDANCE POLICY

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

#### J. RESOURCES INFORMATION

- All assignments, hand-outs and presentations are available on my school website including a copy of this syllabus.

#### K. AFFIDAVIT

- See following page.

## **Principles of Engineering 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.

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Student Printed Name

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Student Signature

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Parent Printed Name

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Parent Signature

**Please sign and return to the instructor.**