

Unit 1 – Understanding Engineering

You should be able to test on the following topics.

1. Steps of the Engineering process
2. Design a simple project using the Engineering Process
3. Accurate Measuring using a ruler and Vernier caliper
4. Calculate
 - a. Area of a
 - i. square = $L \times W$
 - ii. circle = πr^2
 - iii. triangle = $\frac{1}{2} B \times H$
 - b. Volume of a
 - i. Rectangular Solid = $L \times W \times H$
 - ii. Cylinder = $\pi r^2 H$
 - c. Surface Area of a
 - i. cube = $6 \times L \times W$
 - ii. cylinder = $2 \pi r^2 + 2 \pi r \times H$
5. Conversions between
 - a. Inches and centimeters $\rightarrow 1 \text{ inch} = 2.54 \text{ cm}$
 - b. Feet and meter $\rightarrow 1 \text{ meter} = 3.28 \text{ ft}$
 - c. Pounds and Kilograms $\rightarrow 1 \text{ kg} = 2.20 \text{ lbs}$
 - d. metric prefixes \rightarrow Look at Table \rightarrow
6. Explain the Law of Conservation of Energy
7. List 6 types of energy
8. Solve for
 - a. Kinetic Energy = $\frac{1}{2} m v^2$
 - b. Gravitational Potential Energy = mgh
 - c. Elastic Potential Energy = $\frac{1}{2} k x^2$

Symbol	Prefix	Power
k	kilo	1 000 or 10^3
h	hecta	100or 10^2
da	deka	10 or 10^1
THE BASE	-----	0
d	deci	0.1 or 10^{-1}
c	centi	0.01or 10^{-2}
m	milli	0.001 or 10^{-3}