Semester 2 Final Study Guide

Best Way to Study

- Review MyPLTW, Slides, Activities, and Project
- The [Engineering Formula Sheet](#) will be provided

Unit 4.1 Statics

(4.1.2, 4.1.3, 4.1.4, 4.1.6, 4.1.7

Terms/Concepts:
- Statics
- Beam Deflection
- Structural Member Properties
- Centroids
- Modulus of Elasticty
- Force Vectors
- Free Body Diagrams
- Stress
- Strain
- Moments
- Method of Joints
- Truss
- Statically determinate/indeterminate
- Deformation
- Roller
- Compression
- Tension
- Pin
- Truss endpoints
- Static equilibrium

Unit 3.1 Electricity

- (3.1.2, 3.1.3, 3.1.4, 3.1.5, 3.1.6)

Terms/Concepts:
- [Fun With Digital Electronics](#)
- [Breadboard and Electronic Components](#)
- **L7805** voltage regulator
- RC (Resistor-Capacitor) circuit
- [Transistors and Capacitors](#)
- [Blinking LED Circuit (Astable Multi-vibrator)](#)
- Schematic
- Float
- Ground
- Resistor
- Capacitor
- Switch
- LED
- Diode
- Logic Gates – AND, NAND, OR, NOR, XOR, NOT
- IC
- DIP Switch
- Bread Board
- Jumper
- Latch/Flip-flop
- 555 Timer
- 7 Segment Display
- Mulitmode Meter
- DC Power Supply

Unit 3.4 Control Systems

Terms/Concepts:

- VEX Code
  - What is the "comment" purpose?
  - What are loop commands?
  - What does "when started" do?
  - What does "while" do?
  - What does "wait" do?
  - What does "wait until" do?
  - What does "forever" do?
  - Understand "if…then…else"
  - Understand nested "if…then…else"
  - Variable types
  - Know how "set" and "change" work with a variable
  - Know what "print" does
  - Know how to clear text on brain
  - Know how and when to use a function
- VEX Brain Motor and Sensors
  - Difference between VEX Motor and Servo?
  - Why is a bumper switch and limit switch a digital sensor?
  - Know the purpose of distance sensor and its approximate range (in inches). Know that it can determine size and approach speed.
  - Know purpose of optical sensor (brightness, proximity, and hue)
  - Know the purpose of the potentiometer
  - Know the uses of the brain
  - Know the difference between a smart port and 3 wire port
  - Know the parts and how to connect them (battery, battery cable, brain, sensors, connectors)
  - Know how to use the motors and sensors in VEX Code
- Flow Chart
  - Know the parts of the flow chart
  - Know how to read a flow chart