

(30 pts) Approx. 3 days

The first part of this unit is all about getting used to the idea of truth tables and how to use them to understand and create both unsimplified logic expressions as well as basic circuits. Simply put, a *truth table* is a grid that helps organize all the possible combinations of inputs for a circuit, and then describes the resulting outputs from that same circuit. Truth tables are useful in many branches of mathematics, and they're almost always the first step in our work as digital engineers.

1. Start by watching the video *Combinational Logic Overview* which will summarize briefly how truth tables are meant to be used with a basic example. Take good notes!
2. Then, watch the *Truth Tables to Logic Expressions* video and add to your notes so that you have at least a full page. Pay particularly close attention to creating logic expressions from the truth table.
3. Now, complete the *Truth Tables Assignment*. Take your time and make sure you understand what the truth table is trying to represent!
4. Next, watch the videos *AOI Logic Analysis* as well as *AOI Overview*. Both of these together will help explain where circuits come from in a truth table. Make sure you take a full page of notes on this topic!
5. Complete the *AOI Circuits to Truth Tables Assignment*.
6. Check your assignments with the key to make sure everything makes sense and that any questions you have get answered.
7. Have Mr. Benshoof check-off your completed assignments before you move on!

Example Truth Table, Expression, & Circuit

Part 1: Tasks	5 points	4-3 points	2-1-0 points
 Logic Expressions Notes	+ Watch both the <i>Combinational Logic Overview</i> and <i>Truth Tables to Logic Expressions</i> videos + Take a full page of notes on those concepts	- Less than a full page of logic notes	- Very brief or no notes in your engineering notebook
	10-8 points	7-4 points	3-0 points
 Truth Tables Assignment	+ Complete the <i>Truth Tables Assignment</i>	- Assignment incomplete - Assignment not corrected	- Assignment missing - Assignment totally incomplete
	5 points	4-3 points	2-1-0 points
 Logic Analysis Notes	+ Watch the <i>AOI Logic Analysis</i> and <i>AOI Overview</i> videos + Take a full page of good notes on AOI circuits & logic	- Less than a full page of notes on AOI logic	- Very brief or no notes in your engineering notebook
	10-8 points	7-4 points	3-0 points
 AOI Circuits to Truth Tables Assignment	+ Complete the <i>AOI Circuits to Truth Tables Assignment</i>	- Assignment not fully complete - Assignment not corrected	- Assignment missing

