(50 pts) Approx. 3 days

The final part of our unit introduces two very new things: 2's Complement Arithmetic and the XOR/XNOR logic gates. First, the 2's Complement Arithmetic will be the most confusing thing of the whole unit. This process lets us represent negative binary numbers using the standard system of all 0's and 1's. This goes on to let us do addition and subtraction with digital circuits. To do that, we'll need to explore XOR and XNOR logic gates before we can create a full binary addding circuit.

1. Watch the *Binary Math, 2's Complement Arithmetic,* and *2's Complement Again* presentations. Together, these presentations should introduce the idea of doing math with binary numbers, and also how we can represent negative numbers in binary. Take a full page of good notes on the topic, and be sure to include examples of how that binary math can be done!
2. Complete the 2's Complement Assignment. This assignment is all just math (no circuits), and you should take your time and show all your work. The better you understand the written math here, the easier the circuits will be to understand later.
3. Watch the presentation *XOR, XNOR & Binary Adders* and take a full page of notes on the topic. Make sure that your notes include a good description of what the XOR and XNOR gates do logically, as well as how binary adders work.
4. Simulate the AOI Binary adder as well as the 74LS183 add gates circuits in Multisim
5. Use your simulated circuits to complete the Binary Adders Assignment. Make sure that you completely fill out each truth table to confirm that your circuits are working properly. Also make sure to complete the final math problems in your engineering notebook!

Part 3: Tasks	5 points	4-3 points	2-1-0 points
▢ 2's Complement Notes	+ Your took a full page of notes on the binary math and the 2's complement process + Your notes include some practice problems	- Your notes are missing some important parts	- Your notes are missing many parts - You took no notes
	10 points	**9-6 points**	**5-0 points**
📄 2's Complement Assignment	+ You completed the *2's Complement Assignment* + All math problems are completed in your engineering notebook	- You did not fully complete the assignment - Some problems are missing	- The assignment is mostly incomplete - Nothing is in your engineering notebook
	5 points	**4-3 points**	**2-1-0 points**
▢ XOR/XNOR Notes	+ Your took a full page of notes on *XOR, XNOR, and Binary Adders* + Your notes include a description of what XOR and XNOR do + Your notes discuss binary adders	- Your notes are missing some important parts	- Your notes are missing many parts - You took no notes
	10 points	**9-6 points**	**5-0 points**
⊕ Multisim Binary Adders	+ You created both binary adders in Multisim + You confirmed that they work correctly	- You only created one of the Multisim circuits	- You did not create any Multisim circuits
📄 Binary Adders Assignment	+ You completed the assignment + All truth tables are filled out + The math problems are completed	- Your assignment is not fully complete - A part of the assignment is missing	- You missed many parts of the assignment - The assignment is totally missing
☑ Take the Unit 4 Quiz!	+ You took the Unit 4 Quiz before the due date + Your grade is based on the number correct	N/A	- You did not take the Unit 4 Quiz by the due date