Week	Topic	Required Reading & Watching
8/26-8/30 1 (NO Lab)	Intro to course and analog vs digital Intro to Digital Design; Digital vs Analog; Binary Numbers Implement Dig. Systems; Switches; MOS Transistors; Logic Gates Using Gates; Boolean Algebra; Representing Boolean Functions	Syllabus, Due Dates, Labs (121) Text 1.1-1.3 Text 2.1-2.4 (342) Watch how MOSFETs work https://www.youtube.com/watch?v=QO5FgM7MLGg (~8.5 min) -cc Watch how to build basic gates out of MOSFETS-CMOS https://www.coursera.org/learn/electronics/lecture/TA8qw/6-3-cmos-logic-gates (~10.5 min)- subtitles Text 2.4-2.6 App A (563) Watch Basic Boolean Axioms and Theorems *(be careful of last example where text in video notes slight error in circuit drawing)* https://www.youtube.com/watch?v=TIYTI8rhaN8 (~22 min) -cc

9/2-9/6 2 (Lab 1)	Continuing Boolean Algebra and truth tables, more gates	Text 2.6-2.8 (784) Watch video on De Morgan's Laws https://www.youtube.com/watch?v=W4KICOSIQGs (~4.5 min) - * Watch canonical representation https://www.youtube.com/watch?v=Gjsfx-o7nnQ (~8 min)-cc
	Decoders and Muxes	Text 2.9 (9105) Watch Video decoders https://www.youtube.com/watch?v=DgVkEVI6_Ws (~10.25 min) -cc Watch Video on Mux https://www.youtube.com/watch?v=kpGEL7Xynjc (~19 min) –cc
	K-Maps	Texas 6.2 (11126) Watch K-Maps https://www.youtube.com/watch?v=CpsJoAwreqo (~5.5 min) -cc
9/9-9/13 3 (Lab 2)	Propagation Delay; Minimization	Text 2.10 6.2 (13147) Watch Propagation Delay https://www.youtube.com/watch?v=RWvppe0XMx4 (~3 min) -cc
	Data Paths – Registers and Adders	Text 4.1-4.3 (15168) Watch 4-Bit Register https://www.youtube.com/watch?v=PwsDLAFE1sE (~ 7.3 min) -cc Watch PISO Register https://www.youtube.com/watch?v=7LmBcGiiYwk (~7.5 min) -cc Watch Half and Full Adders https://www.youtube.com/watch?v=mZ9VWA4cTbE (~ 13 min) -cc
	Comparator; Multiplier	Text 4.4-4.5 (17189) Watch Comparators https://www.youtube.com/watch?v=U9YPDgd0p9s (~ 18 min) -cc Watch Array Multiplier https://www.youtube.com/watch?v=gTxgiJHBfsI&t=243s (~ 7 min) -*
9/16-9/20 4	Subtractors and Signed Numbers	Text 4.6 (19,20,10) Watch Full Subtractor https://www.youtube.com/watch?v= IukUkIs5kL4 (~15Min) -cc Subtraction with 2's complement

4 (Lab 3)	Arithmetic Logic Units	https://www.youtube.com/watch?v=vfY7bN_3VKw (~ 5min) -cc Watch 2's Complement https://www.youtube.com/watch?v=zWWWZJ_w2CA (~2.3 min)-cc Text 4.7 (212211) Watch ALU https://www.youtube.com/watch?v=1I5ZMmrOfnA (~11 min) -cc
9/23-9/27 5 (Lab 4)	Verilog SR Latches and D Flip Flops	Text 9.2 -9.3 (232412) Watch Intro https://www.youtube.com/watch?v=q1QwC3YlHG0 (~4.7 min) -cc Look at slides at http://www.ece.tamu.edu/~sunilkhatri/courses/ee449/notes/verilog.pdf Text 3.1-3.2 (252613) Watch SR Latch and Gated SR Latch https://www.youtube.com/watch?v=-aQH0ybMd3U (~ 12.2 min) -cc https://www.youtube.com/watch?v=eFivBsjjlvo (~9.5 min) -cc Watch D Flip Flop https://www.youtube.com/watch?v=Sh6B0lbiw4E (~6 min) -cc
9/30-10/4 6 (Lab 5)	Verilog and Simulation	Text 9.4 (272814) Watch Adder in Verilog https://www.youtube.com/watch?v=bL3ihMA8_Gs (~ 16 min) -cc Continue to review slides in http://www.ece.tamu.edu/~sunilkhatri/courses/ee449/notes/verilog.pdf
10/7-10/11 **7**	Finite State Machine and Controller Design	Text 3.3 3.4 (293015) What is a FSM https://www.youtube.com/watch?v=

7 (Lab 6)	Metastability and Glitches State Reduction	-WlrfGUg6tk (~9 min) -cc Watch Reduced State Machine https://www.youtube.com/watch?v=bBcACMJotYg (-16.5 min) -cc Text 3.5 (313216) Watch Timing Issues https://www.youtube.com/watch?v=IoPp9AKagYs (~18 min) -cc Text 6.3 (333417) Watch state reduction https://www.youtube.com/watch?v=mxyLoatx3Fg (~9 min) -cc Watch state assignmets https://www.youtube.com/watch?v=PvTeAJw9QF0 (~1.5 min) – no spoken Watch Mealy vs Moore https://www.youtube.com/watch?v=S352lyPZP00 (~12.5 min) –cc
10/14-10/18 8 (Lab 7)	Verilog for FSM and Testing Shifters, Counters, and Timers Register Files, and Component tradeoffs	Text 9.5 (353618) Watch 2 videos –both examples https://www.youtube.com/watch?v=9fex4Tt10-g (~16min) –cc https://www.youtube.com/watch?v=ENH-8zZLbK8 (~5.5 min)-cc Text 4.8-4.9 (373819) Watch Shift register https://www.youtube.com/watch?v=54AssCQ2w80 (~19.75 min) -cc Watch Counter https://www.youtube.com/watch?v=kdF-U8xROKI (~11.33 min) -cc Text 4.10-4.11 (394020) Watch Registers https://www.youtube.com/watch?v=24MqCDIvQVI (~8 min) -cc Text 4.13 Watch how ultrasound works https://www.youtube.com/watch?v=vloFWz-041k (~3 min)- cc Watch beamforming https://www.youtube.com/watch?v=8rMtqRObvvU (~3 min) -cc

10/21-10/25 9 (Lab 8)	Design Examples- FSM Controller Design Examples- Computers	Watch Vending Machine https://www.youtube.com/watch?v=KHanq9mriJI (~11.75 min) -cc Watch traffic controller https://www.youtube.com/watch?v=kgABPjf9qLI (~15 min) -cc Watch Turing Machine (414221) https://www.youtube.com/watch?v=gJQTFhkhwPA (4.3 min) -cc (434422)
10/28-11/1 10 (Lab 9)	Register Transfer Language	Text 5.1-5.3 (454623) Watch RTL https://www.youtube.com/watch?v=Tus1Tjhnd2w (4.3 min) -cc Watch Languages Difference in HLSM and FSM https://www.youtube.com/watch?v=kAMlJeYG9J8 (15 min) -cc
11/4-11/8 11 (Lab 10)	Design and clock frequency RAM, Rom, Flash memory FIFOs and multiple processors	Text 5.4-5.5 (474824) Watch datapath timing https://www.youtube.com/watch?v=2boNpfT2Jmc (~6.3 min) -cc Watch Parallelism https://www.youtube.com/watch?v=m4T7p9k3LgE (~2 min) -cc Text 5.7 (495025) Watch RAM https://www.youtube.com/watch?v=o_h8YHeW5sg (~15 min) -cc Watch SRAM vs DRAM https://www.youtube.com/watch?v=mwNqzc1o5zM (~4.25 min) -cc Watch ROM https://www.youtube.com/watch?v=9-ivunH8Aps (~13.25 min) -cc Text 5.8-5.9 Watch a use of FIFO (515226) https://www.mathworks.com/videos/asynchronous-fifo-design-and-buffer-modeling-68922.html (4.5 min) -*

11/11-11/15	Hierarchies-Cell Phone	Text 5.10, 5.13 (535427) Watch How cell phone works https://www.youtube.com/watch?v=xv9dRENgDoc (~ 3.3 min) -cc Watch how cell networks work https://www.youtube.com/watch?v=cJQZvxfDFug (~14.75 min) -cc
12 (Lab 11)	RTL design Optimization and tradeoffs	Text 5.11, 6.5-6.6, (555628) Watch Pipelining https://www.youtube.com/watch?v=Sk4puph6GCI (~11.6 min) -cc
	Manufacturing ICs	Text 7.1-7.2 (575829) Watch Full custom vs ASIC https://www.youtube.com/watch?v=XhzEhMcHGGI (~10.6 min) -cc
11/18-11/22	FPGAs	Text 7.3 (596030) Watch FPGA basics https://www.youtube.com/watch?v=CfmlsDW3Z4c (`13.3. min) -cc Watch History of programmable logic https://www.coursera.org/learn/intro-fpga-design-embedded-systems/lecture/YaCfa/2-a-brief-history-of-programmable-logic (~9.7 min) -subtitles
13 (NO Lab)		
11/25-11/29	IC Tradeoffs	Text 7.5 (616231)
14 (Lab 12)	Processors M Processors Continued	Text 8.1-8.5 (636432) Watch datapaths https://www.youtube.com/watch?v=ibYYqvp9FmU (~ 15 min) -cc Text 8.6 Watch Fetch/Decode/Execute https://www.youtube.com/watch?v=XM4lGflQFvA (~5 min) -cc
	Error Detection and Correction Testing and Encryption	NOTES (656633) Watch Hamming Code https://www.youtube.com/watch?v=cBBTWcHkVVY (~ 5.5 min) -cc Watch https://www.youtube.com/watch?v=3fhNN4OdHZI (~9min)