

1. ECE 394 Digital Systems Laboratory.
2. 1 credit. 3 hour laboratory.
3. M. M. H. Sarker.
4. ECE 394 Digital Design Laboratory Manual, 2007.
5.
 - a. Experiments emphasize digital design from basic electronic circuits to complex logic. Topics include switching speed circuits, basic sequential circuits, the arithmetic/logic unit, and computer memories. Prerequisites: ECE 251, ECE 271, ECE 291.
 - b. Required for CoE.
6.
 - a. Objectives of the course
Student should be able to
 - i. construct combination circuits with discrete gates
 - ii. construct sequential circuits using flip-flops
 - iii. construct digital circuits with digital components such as shift-register, counter, memory, and ALU
 - iv. design digital circuits using digital components
 - v. use CAD tools to program programmable logic devices.
 - vi. write lab. reports documenting the results of the lab experiments.
 - b. ABET outcomes:
 - (b) an ability to design and conduct experiments, as well as to analyze and interpret data
 - (c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
 - (g) an ability to communicate effectively
 - (k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.
7. Logic gates, combinational circuits, sequential circuits, shift register, gate function detector, counters, memory, ALU

8. Schedule:

Teaching Week	Experiments	Q/A
Week 1 Sep 10,12	E-1 Logic Gates and Logic Families	
Week 2 Sep 17,12	E-2 Combinational Circuits	Q/A
Week 3 Sep 24,12	E-3 Sequential Circuits	
Week 4 Oct 01,12	E-4 Programmable Logic Devices	
Week 5 Oct 08,12	E-5 Shift Registers	Q/A
Week 6 Oct 15,12	E-6 Gate Function Detector	
Week 7 Oct 22,12	E-7 Counters	
Week 8 Oct 29,12	E-7 Counters	Q/A
Week 9 Nov 5,12	E-8 Memory and ALU	
Week 10 Nov 12,12	E-8 Memory and ALU	
Week 11 Nov 19,12	E-9 4-bit RPN Calculator	Q/A
Week 12 Nov 26,12	E-9 4-bit RPN Calculator	
Week 13 Dec 03,12	Project	
Week 14 Dec 10,12	Project	