

[EE320] Digital System Laboratory

Spring 2020

- **Course Overview**

The aim of this course is to give students hands-on experience in designing and building digital systems through practical experiments. This experimental course, related to basic circuit theory and digital systems, is focused on both hands-on experience and design practice with the following experiments: 1. Utilization of experimental equipment such as oscilloscope, power supply, and function generator, 2. Basic electric circuit theory with R, L, and C circuit networks, 3. Various digital circuits and systems, 4. Design specific digital system for given functionality as a term project.

- **Instructor:**

- **Seong-Jin Kim**, EB3, #401-1 (kimsj@unist.ac.kr)
- **Kyuho Lee**, EB3, #401-8 (kyuho.jsn.lee@unist.ac.kr)
- **Team teaching:** one professor gives lectures **every two weeks** (grade will be individually given for the two classes)

- **Office Hours:**

- **Seong-Jin Kim:** any time by appointment
- **Kyuho Lee:** any time by appointment

- **TA:**

- TBD

- **Textbooks**

- *Handouts for EE320*, ECE, UNIST
- *Experiments in Digital Fundamentals* 10th edition, David M. Buchla, Pearson Prentice Hall.
- *Digital Design*, 5th edition, M. Mano and M. Ciletti, Pearson Prentice Hall.
- *Pspice User Manuals & Tutorials*

- **Grading Policy**

- Lab session
 - 5 points per **Pre-Report** and 5 points for **Main-Report**
- Four off-line experiments for two weeks from June 22nd to July 3rd
 - 80 points for **Demonstration** (20 points for each)
 - 40 points for **Additional Main Report** (10 points for each)
- Lab Total: $(5 + 5) \times 12 + (80 + 40) = 240$
- 10 points for both **Lecture attendances**. Starting from 10 points for full attendance, -2 points for each absence. F grade for absences more than five times.
- Total Absolute Score: $240 + 10 = 250$

- **Requirements**

- Pre-learning will be achieved during the lecture and the pre-report for each lab should be prepared before the lab.
- The preliminary report should contain Pspice simulations for the specific circuits which will be implemented in the lab.

- **Due Dates**

- Preliminary reports are due by Friday 1 pm on the present week.
- Main reports are due by Friday 1 pm of the next week.

- **Lab Operation Policy**
 - Written reports should be in English (exception: person's name).
 - No food or drink in the lab. Bottled water with its cap closed may be permitted. An exception to this can be made temporarily by the TA's discretion.
- **Delay Penalty**
 - No delay is acceptable.
- **Announcement and Homework will be given in the Blackboard**
- **Questions? (Blackboard)**
 - Please use the Web Board as much as possible. Questions directly sent by e-mail will also be OK, but it can be delayed by huge e-mails.
- **Schedule**

Week	Monday	Lab. Contents	Lab #
1	3/2	No lecture due to Covid-19: Substituted with reading materials and running simulations with PSPICE	None
2	3/9	No lecture due to Covid-19: DLL1, 2 and DLL 3, 4 are merged and experimented in 7th and 9th weeks, respectively	None
3	3/16	On-line lecture1: Introduction to Digital System Lab	1(K)
4	3/23	On-line lecture2: Review of Basic Circuit Theory and Digital Logic	2(L)
5	3/30	Introduction and BCL1: Introduction to Electrical Experiments with Simple Resistive Circuits	3(K)
6	4/6	BCL2: Thevenin, Norton, Kirchhoff Theorems, and Impedance Matching	4(K)
7	4/13	DLL1 and 2: Number Systems, Boolean Laws, DeMorgan's Theorem, and Logic Circuit Simplification	5(L)
8	4/20	Midterm Exam Week	None
9	4/27	DLL3 and 4: Adder, Magnitude Comparator, Multiplexers and Demultiplexers	6(L)
10	5/4	DLL5: D Latch, D Flip-Flop, and JK Flip-Flop	7(K)
11	5/11	DLL6: One-Shots and Astable Multivibrators, and Asynchronous Counters	8(K)
12	5/18	DLL7: Synchronous Counters	9(K)
13	5/25	HDL1: Introduction to Hardware Description Language	10(L)
14	6/1	HDL2: Stopwatch Design	11(L)
15	6/8	No lecture	None
16	6/15	Final Exam Week	None
17	6/22	Off-line experiment1: Introduction, DLL1 and DLL3	N/A
18	6/29	Off-line experiment2: DLL5 and DLL7	N/A