

ITI1100 B&C DIGITAL SYSTEMS I

Winter 2017 (January 09 – April 08)

Lectures/Laboratories/Tutorials

Section	Activity	Day	Location
ITI1100 B (January 09 - April 08)	Lecture 1	Tuesday 14:30 - 16:00	STE G0103
	Lecture 2	Friday 16:00 - 17:30	STE B0138
	Discussion Group 1	Thursday 17:30 - 19:00	STE B0138
	Discussion Group 2	Wednesday 11:30 - 13:00	MRT 212
	Discussion Group 3	Thursday 17:30 - 19:00	STE H0104
	Laboratory 1	Tuesday 19:00 - 22:00	CBY B302
	Laboratory 2	Thursday 8:30 - 11:30	CBY B302
	ITI1100 C (January 09 - April 08)	Lecture 1	Tuesday 13:00 - 14:30
Lecture 2		Thursday 11:30 - 13:00	STE G0103
Discussion Group 1		Thursday 17:30 - 19:00	HGN 302
Discussion Group 2		Thursday 14:30 - 16:00	FSS 1007
Discussion Group 3		Tuesday 8:30 - 10:00	SMD 221
Laboratory 1		Tuesday 14:30 - 17:30	CBY B302
Laboratory 2		Tuesday 8:30 - 11:30	CBY B302

- **Students must attend all lectures and labs. DGDs highly recommended.**
- **All components of the course (lab reports, assignments etc) must be fulfilled.**
- *The starting week of Laboratories is **to be announced in blackboard**. The starting week and weeks on which Group Discussions take place are **to be announced in blackboard**.*

Description

Digital computers and information. Number systems and alphanumeric codes. Binary arithmetic. Boolean algebra. Logic functions representation, minimization and realization. Analysis, design and implementation of combinational circuits. Basic sequential circuits. Latches and flip-flops. Analysis and design of simple sequential circuits. Registers and counters. Implementation of digital circuits.

Instructor

Dr. Qi (Chi) Hao

Office: SITE4065

Email: ghao@uottawa.ca

Office hours: Fridays 14:00 –15:30

Teaching Assistants

TAs will assist in labs, DGDs, and consultations. TAs: to be announced. TA office hours to be announced in the blackboard.

Text Book

Text book is required.

Available at the University of Ottawa bookstore.

TITLE: Digital Design

Authors: M. Morris Mano & Michael D. Ciletti

Edition: Fifth Edition

Publisher: Pearson-Prentice Hall

Lab Manual

ITI 1100 Laboratory Manual (PDF file available in blackboard)

Marking Scheme

- Assignments 10%
- Laboratories 15%
- Mid-term exam 25%
- Final exam 50%

All components of the course must be fulfilled.

Attendances will be taken randomly 5 times during the term.

Assignment format is **to be announced**.

Course Web Page

Blackboard Course Page. Course information, course notes, assignments, and announcements will be posted in the blackboard.

Course Outline

1. Binary Systems

Digital Systems. Binary Numbers. Number Base Conversions. Octal and Hexadecimal Numbers. Complements. Signed Binary Numbers. Binary Codes. Binary Storage and Registers. Binary arithmetic

2. Boolean Algebra and Logic Gates

Basic Definitions. Basic Theorems and Properties of Boolean algebra. Boolean Functions. Canonical and Standard Forms. Other Logic Operations. Digital Logic Gates.

3. Gate Level Minimization

The Map Method. Four Variable Map. Product of Sums Simplification. Don't Care Conditions. NAND and NOR Implementation. Other Two Level Implementations. Exclusive OR Function.

4. Combinational Logic

Combinational Circuits. Analysis Procedure. Design Procedure. Binary Adder Subtractor. Magnitude Comparator. Decoders. Encoders. Multiplexers.

5. Synchronous Sequential Logic

Sequential Circuits. Latches. Flip Flops. Analysis of Clocked Sequential Circuits. Design Procedure.

6. Registers and Counters

Registers. Shift Registers. Ripple Counters. Synchronous Counters. Other Counters.

Laboratory

Labs are compulsory

Each student will have a laboratory session every week (exact schedule will be provided in the blackboard page). There are six experiments to be performed, each requiring a group preparation and completion report.

Laboratory groups will consist of two students only. Students are required to stay in the same group and with the same TA (or two TAs) for the whole semester. Every group performing the experiment is required to record their data on paper and this should be seen and signed by the TA. The data should be attached to the submitted report. One lab report is expected from each group after each lab. **The lab report should be prepared according to the guidelines specified in the lab manual.**

Lab reports are due ONE Week after the experiments.

ONE copy of the report, per group, MUST BE submitted to the TAs. Report format (soft or hard copy) and where to submit are **to be announced by TAs.**

Special Notes

Getting help: Ask Professor at office hours. Ask TAs at consultation hours, or during DGD or lab classes. For DGD and Lab related questions, ask TAs for quick responses.

Announcements: course announcements will be posted at the blackboard course site or by emails.

Taking photos, audio and video recordings during lectures are prohibited.