University of Windsor

School of Computer Science – Summer 2020
COMP-2650-91 Computer Architecture I: Digital Design
Course Outline

Instructor:	Zamilur Rahman **Email:** rahma11u@uwindsor.ca[1] **Office Hours:** Wednesdays, 3:15pm-5:15pm on Blackboard Collaborate Ultra or by appointment.
Lectures:	Tuesdays and Thursdays, 4:00-5:20pm on Blackboard Collaborate Ultra
Labs:	Lab section 1154: Tuesdays, 5:30-6:50pm on Blackboard Collaborate Ultra
	Lab section 1155: Thursdays, 5:30-6:50pm on Blackboard Collaborate Ultra
	Lab section 1156: Thursdays, 7:00-8:20pm on Blackboard Collaborate Ultra
	Lab section 1932: Tuesdays, 7:00-8:20pm on Blackboard Collaborate Ultra
	Lab section 2041: Wednesdays, 5:30-6:50pm on Blackboard Collaborate Ultra
	Lab section 2056: Wednesdays, 7:00-8:20pm on Blackboard Collaborate Ultra
GA/TA Office Hours:	See course website for details.
Course Description:	As it appears in the University of Windsor Calendar. *Number systems, switching algebra, logic gates, circuit minimization. Combinational circuits. Read-only memory, random-access memory, programmable logic. Synchronous and asynchronous sequential circuits. Latches, flip-flops, registers, counters, register transfer language. Digital integrated circuits. Hardware description languages.*
Prerequisite:	COMP-1400.
Recommended Textbook(s):	M. Morris Mano and Michael D. Ciletti. Digital Design: With an Introduction to the Verilog HDL, VHDL, and System Verilog, 6th Edition. Pearson, ISBN: 9780134529561.
Course Website:	https://blackboard.uwindsor.ca/
Course Evaluation:	24% (Maximum of 8 Labs) 24% (Maximum of 4 Assignments) 26% (One Midterm Exam) 26% (Final Exam)
Grading Scheme:	The University of Windsor uses a percentage marking and grading scale. Grades are assigned as integer-valued grades. More details can be found in the senate policy "Grading and Calculation of Averages" at the University of Windsor Senate web page: http://www.uwindsor.ca/secretariat/.

[1]Only emails originating from a valid University of Windsor student account will be considered from students wishing to contact the instructor through email. Please include your full name and student ID in your correspondence

Tentative Lectures schedule[2]

Week	Topic
1: May 18-24	Course outline. Digital Systems and Binary Numbers. Number-base Conversions. Octal and Hexadecimal Numbers.
2: May 25-31	Complements of Numbers. Signed Binary Numbers. Binary Codes. Binary Logic.
3: Jun 1-7	Boolean Algebra and Logic Gates. Axiomatic Definition of Boolean Algebra. Basic Theorems and Properties of Boolean Algebra.
4: Jun 8-14	Boolean Functions. Canonical and Standard Forms. Other Logic Operations. Digital Logic Gates
5: Jun 15-21	Gate-Level Minimization. The Map Method. Four-Variable K-Map. Product-of-Sums Simplification.
6: Jun 22-28	Don't-Care Conditions. Nand and nor Implementation. Other Two-Level Implementations. Exclusive-or Function.
7: Jun 29-Jul 5	*Reading week, no classes*
8: Jul 6-12	Combinational Logic. Combinational Circuits. Analysis Procedure. Design Procedure. **Jul 9, 2020 - Midterm (During Class Period)**.
9: Jul 13-19	Binary Adder–subtractor. Decimal Adder. Binary Multiplier. Magnitude Comparator.
10: Jul 20-26	Decoders. Encoders. Multiplexers.
11: Jul 27-Aug 2	Synchronous Sequential Logic. Sequential Circuits. Storage Elements: Latches. Storage Elements: Flip-Flops.
12: Aug 3-9	Analysis of Clocked Sequential Circuits. State Reduction and Assignment.
13: Aug 10-16	Registers and Counters. Shift Registers.
14: Aug 17-23	Ripple Counters. Synchronous Counters. **Aug 18, 2020: Last day of Classes.**
	Final Exam Date and Time: TBA.

Notes to Students:

- **Homework submission and late submission policy:** Homework assignments are expected to be submitted on the assigned due date and time. Late submissions of assignments are either not accepted or heavily penalized depending upon the length of delays in submissions. You must allocate enough time to complete the assignments; start early and report any difficulties to the instructor. You must follow the submission procedure (e.g., either on Blackboard or hardcopy etc.) mentioned on each assignment before submitting your work. Failure to submit the work in the correct format may also be penalized. (e.g. incorrect, unreadable and/or missing file attachments as instructed). Each assignment must be done individually, with no copying from any other source (see policy on Academic Misconduct).

- **Missed Midterm(s)/Final exam policy:** Midterm tests which are missed for any reason whatsoever cannot be made up. In such cases, where a student has missed a test for medical reasons, the mark for this test will be carried over to the final. A doctor's note will have to be a copy of the official Student Medical Certificate and must specifically say that you were not fit to write the test on the particular day. If you miss the final exam and have valid and verifiable reason, you will be required to write a makeup exam (see the Makeup exam policy below).

- **Missed makeup Final exam policy:** The final exam must be written in order to obtain a grade for the course. If you are not able to write the final exam for medical reasons (same as above), you must contact me within 48 hours after the exam date so that a make-up final exam can be arranged as soon

[2]Students are advised that the topics described above are tentative and that the material and/or depth and order of presentation are subject to change at the discretion of the instructor and student pace.

as possible that is mutually convenient for both of the instructor and the student. There will be no makeup of the makeup final exam and the final grade will be assigned on the basis of completed work.

- **Policy on academic misconduct (cheating/plagiarism, etc.):** You are expected to do all of your work in any of the homework assignments and exams individually, without the help of others. In a plagiarized student's work, you will get zero points for that homework assignments or question in exam and the student(s) will have to answer to the Director of School of Computer Science and/or Dean of Science. This will be irrespective of who cheated from whom. You are responsible to protect your work from others. The University expects that both the data and ideas obtained from any and all published or unpublished material will be properly acknowledged and sources disclosed. Failure to follow this practice constitutes plagiarism and is a form of academic misconduct subject to disciplinary procedures as set out under Senate Bylaw 31.

- **Plagiarism:** SafeAssign will be used for all some or all student assignments in this course, at the instructor's discretion. You will be advised how to submit your assignments. Students who submit semantically equivalent assignments (in other words, the same material with trivial or negligible modifications) will receive a grade of zero on ALL assignments.

- **Student Evaluation of Teaching (SET):** The Student Evaluation of Teaching (SET) will be conducted during the last 2 weeks of the classes

- **Important Dates:**

  Jun 1, 2020 - Academic Add/Drop Full Summer (12 week): Last day for late registration & change of courses
  Jun 27-Jul 5, 2020 - Reading Week for 12 week courses.
  Jul 9, 2020 - Midterm (during class period).
  Jul 27, 2020 - Last Day to Voluntarily Withdraw from Full Summer (12 week) 2020 courses
  Aug 18, 2020 - Last Day of Classes.