EXPANDED COURSE DESCRIPTION
ELECTRICAL ENGINEERING AND COMPUTER SCIENCE
Lassonde School of Engineering
Electrical Engineering Computer Science
LE / EECS 3201 4.0 SECTION E
DIGITAL LOGIC DESIGN
FALL 2018 / WINTER 2019

Last Modified Date: 08/20/2018

COURSE CALENDAR DESCRIPTION

Theory and design of logic circuits used in digital systems. Students will be introduced to transistors as devices, will learn how a transistor can be used as a switch, how to design switching circuits to implement logic gates, and how to use logic gates to construct combinational and sequential logic circuits and functional blocks. It also introduces the students to hardware description languages and modern CAD tools.
Prerequisites: cumulative GPA of 4.50 or better over all major EECS courses (without second digit "5"); LE/EECS 2030 3.00 or LE/EECS 1030 3.00; LE/EECS 2021 4.00, LE/EECS 2200 3.00.

INSTRUCTOR(S)

<table>
<thead>
<tr>
<th>Name</th>
<th>Section / Format / Term</th>
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ADDITIONAL INFORMATION

TOPICS AND CONCEPTS

This course covers the basic principles of switching circuit design and the design and analysis of both combinational and sequential circuits. It also introduces the students to hardware description languages and modern CAD tools. Major topics covered in the lectures include:
• Switching circuits: Transistors as switches, transistor circuits for logic gates, noise margin, CMOS, fan-in, fan-out, power and speed considerations
• Analysis and design of combinational circuits, basic gates, multiplexers, decoders, encoders, and adders.
• Hardware Description Languages (HDL) and the use of HDL to represent and simulate digital circuits.
• Analysis and design of sequential circuits (Flip flops, synchronous and asynchronous design). Design using Algorithmic State Machines.
• Introduction to digital system design (data-path and controllers)

The course includes a hardware-oriented laboratory (2 hours per week)

COURSE LEARNING OBJECTIVES

• Analyze transistor switching circuits in terms of logic behaviour, signal levels and timing
• Use Hardware Description Languages to design and realize standard and custom combinational and sequential circuits
• Implement and test digital systems in programmable logic using modern CAD and test tools
• Choose and apply combinational and sequential circuit elements to solve computational problems
• Describe the concept of states and the sequential behaviour and control of digital circuits

MORE COURSE INFORMATION

All course information and announcement will be through the University Moodle site and the department course materials repository.
ACADEMIC INTEGRITY LINKS
• Senate Policy on Academic Honesty - http://secretariat-policies.info.yorku.ca/policies/academic-honesty-senate-policy-on/
• Academic Integrity - http://lassonde.yorku.ca/academic-integrity

STUDENT LINKS
• Student Rights and Responsibilities - http://oscr.students.uit.yorku.ca/student-conduct
• Religious Observance - https://w2prod.sis.yorku.ca/Apps/WebObjects/cdm.woa/wa/regobs
• Academic Accommodation for Students with Disabilities - http://secretariat-policies.info.yorku.ca/policies/academic-accommodation-for-students-with-disabilities-policy/
• Counselling and Disability Services - http://cds.info.yorku.ca/
• York University’s Policies on Sexual Violence - http://secretariat-policies.info.yorku.ca/policies/sexual-violence-policy-on/
• York University’s Policies on Gender/LGBTQ*/Positive Space - http://rights.info.yorku.ca/lgbtq/

LAND ACKNOWLEDGEMENT
• We acknowledge our presence on the traditional territory of many Indigenous Nations. The area known as Tkaronto has been care taken by the Anishinabek Nation, the Haudenosaunee Confederacy, the Huron-Wendat, and the Métis. It is now home to many Indigenous Peoples. We acknowledge the current treaty holders, the Mississaugas of the New Credit First Nation. This territory is subject of the Dish With One Spoon Wampum Belt Covenant, an agreement to peaceably share and care for the Great Lakes region.
• The Indigenous Framework for York University: A Guide to Action can be found here: http://indigenous.info.yorku.ca/
• Meaning of a land acknowledgement: http://healthydebate.ca/opinions/indigenous-land-acknowledgements

Many courses utilize Moodle, York University’s course website system. If your course is using Moodle, click here to access it.
Moodle @ York University