

What's the point of the PC/CP220 Labs?

Terry Sturtevant

Wilfrid Laurier University

April 29, 2015

What is the purpose of the labs?
Where do I get the lab information?

Why are we here?
Learning Objectives
How will I learn this?

Why are we here?

Why are we here?

- Because my timetable says so

Why are we here?

- Because my timetable says so
- So I spend less time on Facebook

Why are we here?

- Because my timetable says so
- So I spend less time on Facebook
- To get part of my PC/CP220 mark

Why are we here?

- Because my timetable says so
- So I spend less time on Facebook
- To get part of my PC/CP220 mark
- To go over some digital electronics that was covered in class

Why are we here?

- Because my timetable says so
- So I spend less time on Facebook
- To get part of my PC/CP220 mark
- To go over some digital electronics that was covered in class
- To learn some digital electronics that *wasn't* covered in class

Why are we here?

- Because my timetable says so
- So I spend less time on Facebook
- To get part of my PC/CP220 mark
- To go over some digital electronics that was covered in class
- To learn some digital electronics that *wasn't* covered in class

None of the above

Lectures teach digital electronics *design and analysis*

Lectures teach digital electronics *design and analysis*
Labs teach you the *process of building and debugging* circuits

Lectures teach digital electronics *design and analysis*
Labs teach you the *process of building and debugging* circuits
Labs will require you to become familiar with *building blocks*
of digital electronic circuits

Lectures teach digital electronics *design and analysis*

Labs teach you the *process of building and debugging* circuits

Labs will require you to become familiar with *building blocks* of digital electronic circuits

This process is not specific to this course

Lectures teach digital electronics *design and analysis*

Labs teach you the *process of building and debugging* circuits

Labs will require you to become familiar with *building blocks* of digital electronic circuits

This process is not specific to this course

You may not go into a field requiring you to do this professionally ,

Lectures teach digital electronics *design and analysis*

Labs teach you the *process of building and debugging* circuits

Labs will require you to become familiar with *building blocks* of digital electronic circuits

This process is not specific to this course

You may not go into a field requiring you to do this professionally ,
but with all of the electronics we encounter everyday, this is basic information.

What is the purpose of the labs?
Where do I get the lab information?

Why are we here?
Learning Objectives
How will I learn this?

Learning Objectives

Learning Objectives

There are 3 types of learning objectives:

Learning Objectives

There are 3 types of learning objectives:

- 1 Conceptual

Learning Objectives

There are 3 types of learning objectives:

- 1 Conceptual
understanding certain ideas

Learning Objectives

There are 3 types of learning objectives:

- 1 Conceptual
understanding certain ideas
- 2 Practical

Learning Objectives

There are 3 types of learning objectives:

- 1 Conceptual
understanding certain ideas
- 2 Practical
applying knowledge to specific “real-world” tasks

Learning Objectives

There are 3 types of learning objectives:

- 1 Conceptual
understanding certain ideas
- 2 Practical
applying knowledge to specific “real-world” tasks
- 3 Communication

Learning Objectives

There are 3 types of learning objectives:

- 1 Conceptual
understanding certain ideas
- 2 Practical
applying knowledge to specific “real-world” tasks
- 3 Communication
presenting information and results in formats which are typical in professional settings

Learning Objectives

There are 3 types of learning objectives:

- 1 Conceptual
understanding certain ideas
- 2 Practical
applying knowledge to specific “real-world” tasks
- 3 Communication
presenting information and results in formats which are typical in professional settings

Different types of learning objectives lead to different types of assessments.

What is the purpose of the labs?
Where do I get the lab information?

Why are we here?
Learning Objectives
How will I learn this?

Conceptual Learning Objectives for PC/CP220 labs

Conceptual Learning Objectives for PC/CP220 labs

Important ideas to grasp include:

Conceptual Learning Objectives for PC/CP220 labs

Important ideas to grasp include:

- 1 Understanding the purpose of resistors in digital circuits with switches and LEDs

Conceptual Learning Objectives for PC/CP220 labs

Important ideas to grasp include:

- 1 Understanding the purpose of resistors in digital circuits with switches and LEDs
- 2 Adapting wiring depending on whether signals are active HIGH or active LOW

What is the purpose of the labs?
Where do I get the lab information?

Why are we here?
Learning Objectives
How will I learn this?

Practical Learning Objectives for PC/CP220 labs

Practical Learning Objectives for PC/CP220 labs

Tasks to become familiar with include:

Practical Learning Objectives for PC/CP220 labs

Tasks to become familiar with include:

- 1 Creating a truth table or logic equations for a combinational logic circuit from a description of the circuit's behaviour

Practical Learning Objectives for PC/CP220 labs

Tasks to become familiar with include:

- 1 Creating a truth table or logic equations for a combinational logic circuit from a description of the circuit's behaviour
- 2 Testing logic equations using a computer algebra system

Practical Learning Objectives for PC/CP220 labs

Tasks to become familiar with include:

- 1 Creating a truth table or logic equations for a combinational logic circuit from a description of the circuit's behaviour
- 2 Testing logic equations using a computer algebra system
- 3 Wiring circuits on a breadboard following a schematic diagram

Practical Learning Objectives for PC/CP220 labs

Tasks to become familiar with include:

- 1 Creating a truth table or logic equations for a combinational logic circuit from a description of the circuit's behaviour
- 2 Testing logic equations using a computer algebra system
- 3 Wiring circuits on a breadboard following a schematic diagram
- 4 Using various input and output devices in a digital circuit, such as switches, keypads, LEDs, 7 segment displays, etc.

Practical Learning Objectives for PC/CP220 labs

Tasks to become familiar with include:

- 1 Creating a truth table or logic equations for a combinational logic circuit from a description of the circuit's behaviour
- 2 Testing logic equations using a computer algebra system
- 3 Wiring circuits on a breadboard following a schematic diagram
- 4 Using various input and output devices in a digital circuit, such as switches, keypads, LEDs, 7 segment displays, etc.
- 5 Debugging a circuit systematically by tracing signals through a circuit to find where they deviate from expectations and then determining the causes of any discrepancies

Practical Learning Objectives for PC/CP220 labs

Tasks to become familiar with include:

- 1 Creating a truth table or logic equations for a combinational logic circuit from a description of the circuit's behaviour
- 2 Testing logic equations using a computer algebra system
- 3 Wiring circuits on a breadboard following a schematic diagram
- 4 Using various input and output devices in a digital circuit, such as switches, keypads, LEDs, 7 segment displays, etc.
- 5 Debugging a circuit systematically by tracing signals through a circuit to find where they deviate from expectations and then determining the causes of any discrepancies
- 6 Drawing and simulating combinational logic circuits with Altera Quartus II

Practical Learning Objectives for PC/CP220 labs

Tasks to become familiar with include:

- 1 Creating a truth table or logic equations for a combinational logic circuit from a description of the circuit's behaviour
- 2 Testing logic equations using a computer algebra system
- 3 Wiring circuits on a breadboard following a schematic diagram
- 4 Using various input and output devices in a digital circuit, such as switches, keypads, LEDs, 7 segment displays, etc.
- 5 Debugging a circuit systematically by tracing signals through a circuit to find where they deviate from expectations and then determining the causes of any discrepancies
- 6 Drawing and simulating combinational logic circuits with Altera Quartus II
- 7 Programming a CPLD with a combinational logic circuit and verifying its operation

What is the purpose of the labs?
Where do I get the lab information?

Why are we here?
Learning Objectives
How will I learn this?

Communication Learning Objectives for PC/CP220 labs

Communication Learning Objectives for PC/CP220 labs

Professional forms of communication include:

Communication Learning Objectives for PC/CP220 labs

Professional forms of communication include:

- 1 Reading pin diagrams for integrated circuits and correctly identifying pin numbers

Communication Learning Objectives for PC/CP220 labs

Professional forms of communication include:

- 1 Reading pin diagrams for integrated circuits and correctly identifying pin numbers
- 2 Creating technical documentation for phases of a design project

Communication Learning Objectives for PC/CP220 labs

Professional forms of communication include:

- 1 Reading pin diagrams for integrated circuits and correctly identifying pin numbers
- 2 Creating technical documentation for phases of a design project
- 3 Designing a poster to communicate information to a specific audience

What is the purpose of the labs?
Where do I get the lab information?

Why are we here?
Learning Objectives
How will I learn this?

How will I learn this?

How will I learn this?

- *Labs -*

How will I learn this?

- *Labs* -

each week you will be introduced to devices, tools, and techniques that are part of digital electronics

How will I learn this?

- *Labs* -
each week you will be introduced to devices, tools, and techniques that are part of digital electronics
- *Lab Project* -

How will I learn this?

- *Labs* -
each week you will be introduced to devices, tools, and techniques that are part of digital electronics
- *Lab Project* -
over the term, you will combine all that you have learned to start with an idea and turn it into a functioning circuit

How will I learn this?

- *Labs* -

each week you will be introduced to devices, tools, and techniques that are part of digital electronics

- *Lab Project* -

over the term, you will combine all that you have learned to start with an idea and turn it into a functioning circuit

The project will involve your knowledge of the entire design process.

How will I learn this?

- *Labs* -
each week you will be introduced to devices, tools, and techniques that are part of digital electronics
- *Lab Project* -
over the term, you will combine all that you have learned to start with an idea and turn it into a functioning circuit

The project will involve your knowledge of the entire design process.

What is the purpose of the labs?
Where do I get the lab information?

Where do I get the lab information?

Where do I get the lab information?

- The website -

Where do I get the lab information?

- The website -
denethor.wlu.ca/pc220

Where do I get the lab information?

- The website -
denethor.wlu.ca/pc220
Everything for the labs is there.

Where do I get the lab information?

- The website -

denethor.wlu.ca/pc220

Everything for the labs is there.

There is a lot of stuff on the webpage, so spend some time to become familiar with how it is laid out.