

Student name _____

Electrical Engineering

Rapid advancements in the engineering industry, specifically within the fields of electrical, marine, aeronautical, advanced manufacturing and wind turbine, makes working in this industry so exciting and varied.

You will develop your skills in our specialist engineering workshops, which reflect real, working environments and contain all of the latest equipment to enable you to maximise your studies. We have prepared a range of activities below that will help give you an understanding of the industry and we will discuss the topics in further detail once your course has started. Once you have completed the activity below please email it to applicants@sthelens.ac.uk with the subject line, 'Completed Electrical Engineering Applicant Activities'.

We look forward to meeting you soon.
Kind regards,
Electrical Engineering Tutors



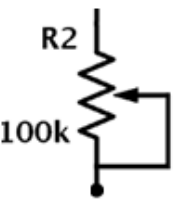

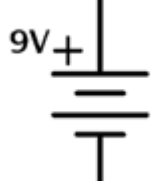
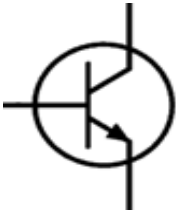
Activity 1

As an electronic engineering student, you are required to design and build a basic control electronic system to specific criteria to reduce the unnecessary working time of the light bulbs

In this activity you are required to build a prototype of a control electronic circuit under the following criteria:

You must produce a circuit diagram showing the electronic components and how they are connected.

- You should use the below electronic components or any equivalent components.
- The circuit must be adjustable to different daylight intensity.
- The circuit works on a 9 V battery.
- The prototype circuit design must be simulated first.
- You can use any free online circuit simulator to test your design.

 <p>LDR Light dependant resistor LDR</p>	 <p>LED 2V Light emitting diode LED</p>	 <p>R2 100k Variable resistor</p>
 <p>R1 390 Fixed resistor</p>	 <p>9V+ 9 V battery</p>	 <p>Q1 BC547 Transistor</p>

There are many free online circuit simulator. **EveryCircuit** is a user-friendly graphical simulator which provides a simple workspace and testing tools. <https://everycircuit.com/>

Activity 2

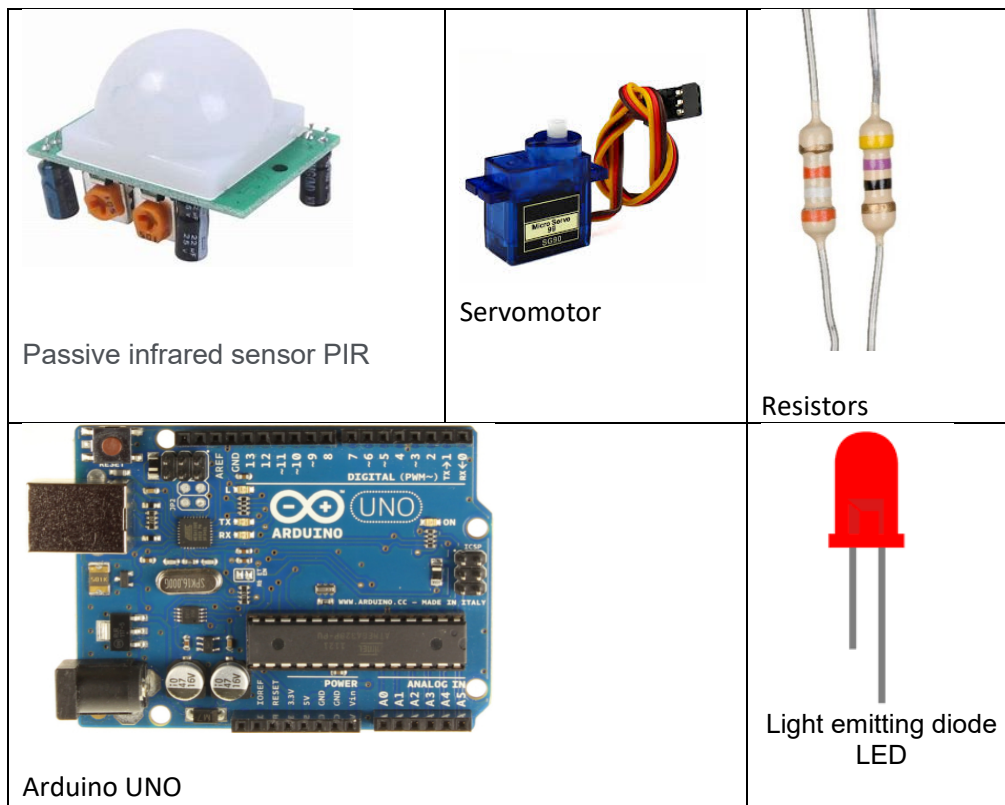
During the current global coronavirus pandemic also called Covid19, the World Health Organisation (WHO) provided guidance to control and reduce the spread of this virus.

Many countries around the world announced national emergency plans to control and reduce the spread of Covid19. People are asked to stay at home and only go out if it is necessary.

As an electronic engineering student, you can contribute in controlling and decreasing the spread of Covid19 by designing and building a basic electronic system to specific criteria to reduce the unnecessary contact with doors in shops and other public places.

In this activity you are required to build a prototype of a control electronic circuit under the following criteria:

- You must use a PIR motion sensor.
- You must use microcontroller such as Arduino UNO.
- You must use a servomotor to open and close the doors.
- The door must keep open for at least 10 seconds after any motion.
- A green light should be turned on when the door is open.
- A red light should be turned on when the door is closed.
- The circuit should work on a 9 V battery.
- The prototype circuit design must be simulated first.
- You can use any free online Arduino simulator.



To simulate the system you can use the free online simulator, TINKERCAD from AUTODESK. It is a user-friendly graphical simulator which provides a simple workspace and testing tools.

<https://www.tinkercad.com/>

To learn about Arduino programming you can use Arduino online tutorial and other YouTube tutorials.

<https://www.arduino.cc/en/Tutorial/HomePage?from=Main.Tutorials>. Or any other online tutorials.