Level 5 HND in Electrical/Electronic Engineering

This course will teach students the core engineering principles and demonstrate how the knowledge gained can be used effectively in the workplace. The programme has been designed to refine your skills at applying analytical and practical techniques to the analysis of complex electrical and electronic systems. Throughout the course, you will complete various units including, but not limited to, Further Electrical/Electronic/Digital Principles, Industrial Systems and Industrial Power, Electronics and Storage.

What does the course include?

The successful completion of this HND course will open many doors for you. Here are a few of the options:

- Progression to degree studies B.Sc./B.Eng. in Electrical Engineering or Electronics Engineering (1 year)
- Apply for the following jobs within industry:
  - Electrical Design Engineer
  - Maintenance Engineer
  - Field Service Engineer
  - Service Engineer
  - Electronics Engineer

Where can this course lead?

Can't wait to get started? Here are some places to get you on your way:

- **Video:** What can you do as an Electrical Engineer? https://www.youtube.com/watch?v=M6oXZUtyCJ4

- **Book:** Electrical Engineering (know it all) http://index-of.co.uk/Mathematics/Electrical%20Engineering%20know%20it%20all.pdf

- **Article:** Engineering Skill for the Future https://www.raeng.org.uk/publications/reports/engineering-skills-for-the-future

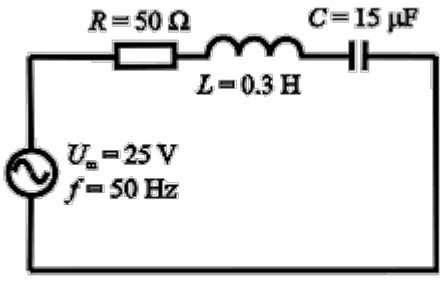
Have a go!

Activity – RLC Circuits

Apart being used in a wide array of electronic devices, RLC circuits have the following applications:

1. To maintain an acceptable voltage profile in long and medium distance power transmission settings. In this case, the capacitive and inductive compensation techniques are used.
2. RLC networks are useful in neutral grounding of generators as these help avoid sudden currents alterations.
3. In CFL bulbs, RLC circuits are used to improve operating power factor of the lamp, which has a direct impact on electricity consumption.

In terms of electricity (AC) every device which uses a magnetic field for its operation is an RL circuit. The use of these devices causes voltage drops at its terminals due to magnetic effect. To compensate this drop, a capacitor is incorporated at the terminals and this becomes an RLC Circuit like the one shown.



Problem:

1. Determine the amplitude of electric current in the circuit. Use the following equation:

$$I = \frac{V_S}{\sqrt{R^2 + \left(2\pi \times f \times L - \frac{1}{2\pi \times f}\right)^2}}$$

Answer: 0.2 Amps

2. Calculate the voltage on each component of the A.C. network. Use the following equations:

$$V_R = I \times R$$

$$V_L = I \times 2\pi \times f \times L$$

$$V_C = \frac{I}{2\pi \times f \times C}$$

Answers: V_R = 10 Volts
V_L = 18.9 Volts
V_C = 42.4 Volts