

# **Title of course: Practical Electronics**

## **Award Received**

Successful completion of the course would result in an award of A-D at National 5 level or a Pass/ Fail at National 4.

## **Entry Level: What do I need to do it?**

There is a considerable amount of mathematical equations and problem solving required in this subject therefore pupils should either have passed or be attempting Maths or Physics at National 5 level.

## **Course Content: What will I learn?**

The National 5 Practical Electronics course provides a broad practical introduction to analogue and digital electronics. Pupils will develop a range of practical skills in electronics, such as soldering and the use of protoboards. Pupils will also develop analysing and problem solving skills, safe use of tools and equipment and skills in evaluating products and designs. Pupils are also required to design and simulate circuits through a dedicated software programme.

### **Course Structure – National 5 Practical Electronics has three areas of study**

- **Circuit Design**

Pupils develop an understanding of key electronic concepts and electronic components. Pupils analyse electronic problems, design solutions to these problems and explore issues relating to electronics.

- **Circuit Simulation**

Pupils use simulation software to assist in the design, construction and testing of circuits and to investigate their behaviour.

- **Circuit Construction**

Pupils gain experience in assembling a range of electronic circuits, using permanent (soldering) and non-permanent (protoboards) methods. Pupils will develop skills in wiring and assembly techniques, carry out testing using digital probes and multimeters and evaluate functionality of circuits.

## **Teaching Methods: What will I do?**

The bulk of the course is delivered through a series of assignments, each one exploring a new electronic concept and technique, culminating in a circuit being modelled using software, then built on protoboard before being permanently soldering into position. Pupils will mainly be working individually, although at times it may be appropriate to work in pairs, particularly when constructing circuits.

When designing circuits, pupils will use formulae to calculate, voltage, current and resistance. Pupils will be required to take notes and complete log books as they progress through the course.

## **Assessment: How will I be assessed?**

There are two components that will determine the overall course assessment; a question paper and a practical activity.

Component One – Question Paper (this is worth 30% of the overall mark)

The external question paper is worth 60 marks. The purpose of the question paper is to assess the application of skills, knowledge and understanding from across the course. The question paper is 1 hour in duration.

Component Two – Practical Activity (this is worth 70% of the overall mark)

The practical activity assesses pupils ability to apply electronic knowledge and skills to solve an appropriately challenging practical problem, and is designed to allow pupils to demonstrate their ability to work independently. This component allows assessment of skills which cannot be assessed through a question paper, for example, circuit simulation, construction and testing. The Practical Activity is has 70 marks.

The Practical Activity allows pupils an opportunity to demonstrate the following skills, knowledge and understanding:

- Analysing a problem
- Designing an electronic solution to a problem
- Simulating their solution on dedicated software
- Construction their solution
- Applying safe working practices
- Testing their solution
- Reporting on and evaluating their solution

## **Homework.**

Pupils will be required to carry out some research at home. There will also be deadlines set when log books and assignments need to be completed and some of this will need to be carried out at home.

## **Progression in the Senior Phase.**

There currently is not a Higher in Practical Electronics. However, this course would be a good stepping stone into Higher Physics.