

# Subject Guide:

## A Level and AS Electronics

### Change to all A Levels

Changes are under way for all A levels in all schools and colleges and some awarding bodies are still revising their syllabuses for 2015. As a result, this guide is an illustration of the content but the exact details may change.

The most significant changes in A Levels and AS exams (but see below for the different timescale in this subject) are:

- All assessment for A Levels will be through end of course exams with no practical element in most subjects.
- There will still be AS as one year “half A Levels” but you won’t be able to add an A2 to make them into a full A Level.
- This means if you want a full A Level you will need to decide that at the start of your course.
- You will still be able to combine A Levels with other types of qualifications such as BTECs.
- These changes are happening at different times for different subjects.
- You’ll have lots of support from us before you have to make your final choice of subjects.

Specifics for this subject:

**The first teaching for the new A Level Electronics qualification has been delayed by the Government. This means September 2015 UTC students will take the AS examination in September 2016 followed by the full A Level in 2017.**



### What is Electronics?

Electronics is the study of the electronic circuits and systems that power and control all modern machines and devices. By studying the course you will gain a good understanding of analogue and digital communication systems, microcontrollers, video display units and electronic control systems.

Electronics gives you a practical understanding of the workings of computerised technology, mobile communications, laser-guided weapons systems and security devices.

Many of the UTC’s supporting employers are specialists in electronic systems in a wide range of applications including:

- aircraft control systems;
- unmanned air vehicles;
- railway signalling;
- electronic surveillance;
- defence countermeasures;
- medical scanning technology; and
- stairlift operations.

As the new A Level programme of study has not yet been developed under the Government’s reforms, students in September 2015 will continue to enter for AS exams in Year 12 and progress, if they wish, to the full A Level in Year 13.

### What GCSEs do I need to study Electronics?

We will expect you to have gained an A\*-B in GCSE Maths and Science in order to show that you will be able to cope with the demanding concepts used in Electronics A Level. Only in exceptional circumstances will we consider students with a C grade who can demonstrate that this grade under-estimated their mathematical potential. It will normally help if you have a genuine interest in applied Electronics for example the working of mobile phones or computers or if you have done practical soldering.



## What could I do with it afterwards?

Electronics is valued as an entry qualification to a wide range of university subjects including Computing, Design Engineering, Electronic Engineering and Digital Communications. It is also valued by employers offering Apprenticeships and degree-level training programmes in industries such as communications, transport, manufacturing, defence engineering and aircraft engineering.



## What form does the assessment take?

All assessment is through end of course exams (i.e. the AS in Year 12 and the A Level in Year 13) and there is no coursework mark.

The AS covers 3 units including one based on practical tasks. A further three units are taken in Year 13 to complete the A Level, including one large practical Electronics project.

## Course details

### AS Electronics (Year 12)

You can take AS as a stand-alone qualification in Year 12 or as part 1 of a full A Level.

It comprises:

#### Simple Electronic Systems and Equipment

- Equations of quantity
- Circuit diagrams with switches and resistors
- Voltage, current and power
- Digital and analogue systems
- Using graphs, tables and Boolean algebra.

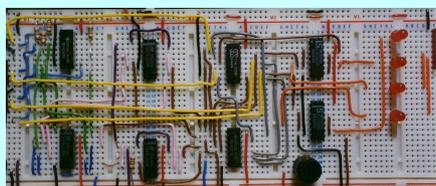
#### Signal Processors

- Using logic gates to store information
- Using negative feedback to process audio
- Amplification and capacitors
- Using microcontrollers in digital systems

#### Controlled Project: Electronics Circuits

- This is an investigation requiring you to design, build, test and analyse three separate circuits (one digital, one analogue and a microcontroller circuit).

- You build the circuit on a board.



### A2 Electronics (Year 13)

The A2 develops the concepts covered in the AS and comprises:

#### Electronic Control Systems

- MOSFET Circuits (variable resistors & amplifiers) within analogue circuits
- Digital processing & memory storage
- Use of negative feedback in control systems
- Use and behaviour of microcontrollers

#### Communication Systems

- Video displays, pixels and bandwidth
- Modulating carriers (AM and FM)
- Noise and interference
- Frequency Division Multiplexing (FDM) and its use in frequency allocation
- Time division multiplexing (for example in telephone systems)
- Computerised information exchanges

#### Major Project: Design, Build and Investigate

- The A2 project involves designing, building, testing and analysing a circuit that could actually be used.