

RECOMMENDED LEVEL OF ATTAINMENT

It is unlikely that students who do not have a sound understanding of Science Level 1 particularly Physics (minimum 16 science credits) and Mathematics Level 1 (12 credits minimum) would succeed in this course. However, there are specific places held in the course for students that do not meet the above criteria but wish to work in ICT at the discretion of the Teacher in Charge and the Head of Department. Such students need to show strength in Technology (TAS), Design and Visual Communication (DVC).

INTRODUCTION

This is the first of a two-year pathway. Students will develop their knowledge and skills in electronics to enable them to gain University Entrance and potentially scholarship in the following year through the new Digital Technology Achievement Standards. In practical experiments and laboratory sessions, students will learn to design electronic circuits and products that are fit for purpose. Through industry trips, students will also acquire an understanding of the career opportunities within the electrical, engineering, programming and ICT industries. Students will also be given priority invitations to join VEX Robotics, NXT Robotics and programming clubs, all of which lead to international competitions. Much of the work conducted in these clubs will be able to be drawn into projects that count for Achievement Standard credits.

CONTENT

- Circuitry, measurements and calculations;
- PCB design and construction skills. Testing and modification of circuits;
- Circuit design involving both discrete components and integrated circuits;
- Electrical direct current principles relevant in the study of electronics;
- Electronic components, including sensor systems and animatronics;
- Combinations of components to form simple electronic systems;
- Practical construction of a printed circuit including hand soldering of components;
- Construction and programming of simple electronic products, including robotics.

ASSESSMENT

Students complete an Achievement Standard (AS) course which will lead to University, Polytechnic or Electro-technology industry training. However to develop the essential skill base for Electronics Technology, students will complete one Unit Standard (US) on constructing a simple printed circuit, so they can master the skills demanded by the Digital Technology Achievement Standards.

FUTURE PATHWAYS

This is the first of a two-year pathway intended for students aspiring eventually (from year 13) to electrical, electronics and robotics careers across all economic sectors. Please refer to Vocational Pathways at <http://youthguarantee.net.nz> for more information. Students with these aspirations should also be studying physics and/or calculus.

NCEA STANDARDS – 12DTE

Not all standards will necessarily be assessed.

	Level	Credits	UE Rdg.	UE Wrtg.	
Internal					
18240 v7	2	5	no	no	Demonstrate knowledge of basic electronic components
18242 v7	2	3	no	no	Construct a simple printed circuit
18243 v7	2	6	no	no	Construct a simple electronic product from a supplied circuit schematic
91374 v4	2	3	yes	no	Digital Technologies 2.47 - Demonstrate understanding of advanced concepts used in the construction of electronic environments
91375 v4	2	3	no	no	Digital Technologies 2.48 - Implement advanced interfacing procedures in a specified electronic environment

RECOMMENDED LEVEL OF ATTAINMENT

It is unlikely that students who have not gained at least 12 credits from Digital Technology Level 2 (DTC or DTE) would succeed in this UE approved course.

INTRODUCTION

In this course students will develop their knowledge and skills in electronics to enable them to design circuits and products that are fit for purpose and acquire an understanding of the career opportunities within ICT industries.

Course content:

- Basic circuitry, measurements and calculations.
- PCB design and construction skills.
- Circuit design involving both discrete components and integrated circuits.
- Programming and using a microcontroller.
- Analogue and digital concepts and inter-conversion.
- Understanding IR communications between micros.
- Management skills in designing and constructing an individual project.
- Industry organisation that efficiently transforms a concept into a product for market.

ASSESSMENT

Students will have the opportunity to gain credits in the standards below. They may select a 20 credit course from the following: either a Unit Standard (US) Industry focused course, if their career goals are Electrical

Trades or Polytechnic training, or an Achievement Standard (AS) course, if their career goal is to enter University. Scholarship entries can be developed from any project that gains an Excellence credit.

Important Note: All standards offered in 13 DTE (including Unit Standards) may be assessed for Merit/ Excellence, and count toward NCEA and Subject endorsement.

FUTURE PATHWAYS

This is the last of a 2 year pathway intended for students aspiring eventually (from year 13) to degree level careers in electrical, electronics and robotics careers across all economic sectors. Please refer to Vocational Pathways at <http://youthguarantee.net.nz> for more information.

Students with these aspirations should also be studying physics and/or calculus.

COSTS

\$140 will be invoiced in March to cover the cost of components used in this take home product.

NCEA STANDARDS – 13DTE

Not all standards will necessarily be assessed.

	Level	Credits	UE Rdg.	UE Wrtg.	
External					
91638 v2	3	4	yes	no	Digital Technologies 3.47 - Demonstrate understanding of complex concepts used in the design and construction of electronic environments
Internal					
9221 v9	3	3	no	no	Demonstrate knowledge of the development of an electronic product
26119 v5	3	4	no	no	Construct, and report on the performance of, a simple electronic programmable circuit
26120 v5	3	3	no	no	Describe and construct circuits to demonstrate the operation and properties of electronic devices
26121 v5	3	6	no	no	Plan, construct, modify, and report on an electronic prototype
91639 v2	3	4	yes	no	Digital Technologies 3.48 - Implement complex interfacing procedures in a specified electronic environment
91640 v2	3	4	yes	no	Digital Technologies 3.49 - Implement complex techniques in constructing a specified complex electronic and embedded system