

**VET in the VCE  
ELECTROTECHNOLOGY**

**21583VIC  
Certificate II in Electrotechnology  
(Shared Technology)**

**March 2005**

**This program booklet must be used in conjunction with the course accreditation document**

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The artwork on the cover has been reproduced from 1998 VCE student work:

Clare James

*Can Opener* 1998 (detail)

Ink, gouache and oil stick on paper

188 x 152.5 cm

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# Introduction

VCE VET programs are vocational certificates approved by the Victorian Curriculum and Assessment Authority (VCAA) as appropriate for senior secondary school students, fully integrated within the VCE and endorsed for recognition in the VCE by the Victorian Qualifications Authority (VQA).

VCE VET programs lead to nationally recognised qualifications, thereby offering students the opportunity to gain both the VCE and a nationally portable vocational education and training certificate.

VCE VET programs:

- are fully recognised within the Unit 1–4 structure of the VCE and therefore may contribute towards satisfactory completion of the VCE. VCE VET units have equal status with other VCE studies.
- may contribute to satisfactory completion of the Victorian Certificate of Applied Learning (VCAL).
- function within the National Training Framework.

## NATIONAL TRAINING FRAMEWORK

The two key elements of the National Training Framework are the Australian Quality Training Framework (AQTF) and training packages. Under the AQTF, Registered Training Organisations (RTOs) are responsible for the assessment and certification of training qualifications, regardless of whether programs are curriculum based or based on training packages.

National training packages are agreed to by Industry Skills Councils (formerly Industry Training Advisory Bodies) and endorsed by the Australian National Training Authority (ANTA). Training packages consist of a set of competency standards, assessment guidelines and national qualifications that apply across an industry. These packages underpin delivery of training by RTOs and industry.

The 21583VIC Certificate II in Electrotechnology (Shared Technology) includes five units of competence drawn from the UTE99 Electrotechnology Training Package, ICA99 Information Technology Training Package and ICT02 Telecommunications Training Package. All the other units of competence are new and have been specifically written for the Certificate II in Electrotechnology (Shared Technology).

Certificate II in Electrotechnology (Shared Technology) has been accredited by the VQA as a nationally recognised qualification.

## PROGRAM REVISION

This program booklet replaces the VCE VET Electronics booklet published in September 1999. The enhanced recognition status of VCE VET programs and the accommodation of the requirements of assessment for Study Score purposes are reflected in this program booklet.

For the new Certificate II in Electrotechnology (Shared Technology), the units of competence have been grouped to form Units 1–2 and a Unit 3–4 sequence for VCE recognition purposes.

### **ARRANGEMENTS FOR CONTINUING STUDENTS**

Students enrolled in the VCE VET 2206AKC Certificate II in Electronics in 2004 or earlier, should complete their program under the arrangements outlined in the VCE VET Electronics program booklet published in September 1999. No new students may enrol in 2206AKC Certificate II in Electronics in 2005 and beyond.

### **STUDENTS COMMENCING IN 2005**

All students commencing the 21583VIC Certificate II in Electrotechnology (Shared Technology) in 2005 and beyond must comply with the requirements outlined in this booklet.

# Program details

## AIMS

The aims of the VCE VET Electrotechnology (Shared Technology) program are to:

- provide participants with the knowledge and skills to achieve units of competence that will enhance their employment prospects in the electrotechnology and related industries
- enable participants to gain a recognised credential and make a more informed choice of vocation and career paths.

The Certificate II in Electrotechnology (Shared Technology) provides a pathway into industries that are likely to combine different types of technologies. These industries include automotive, building and construction, electrical, electronics, engineering, information technology and telecommunications.

## COMPLETION REQUIREMENTS

The following information needs to be read in conjunction with the course accreditation document for 21583VIC Certificate II in Electrotechnology (Shared Technology).

### Structure of the qualification

The Certificate II in Electrotechnology (Shared Technology) is comprised of three core units of competence and 28 elective units of competence grouped into industry specialisations. To be eligible for the award of the certificate students must complete all core units and complete elective units totalling a minimum of 150 hours of training, from at least two different specialisation clusters.

The electives in the Certificate II in Electrotechnology (Shared Technology) are grouped into five specialisations. The specialisations cover industries that are likely to combine different types of technologies.

The industry specialisations are:

- Computer System Networks
- Wireless Communications
- Energy Generation
- Robotics and Embedded Controllers
- Photonics.

The VCE VET program offers all core units of competence and all elective units of competence for selection.

### **PROGRAM DURATION**

The Certificate II in Electrotechnology (Shared Technology) involves a nominal duration of 390–440 hours, depending on the electives selected.

The nominal hours attached to each unit of competence are calculated by the Office of Training and Tertiary Education (OTTE) for funding purposes. They are a guide only, and the actual duration of the training required is affected by students' readiness to be assessed for the particular unit of competence.

It is important to note that the allocation of nominal hours for each unit of competence is intended to cover both delivery and assessment.



**PROGRAM STRUCTURE:****CERTIFICATE II IN ELECTROTECHNOLOGY (SHARED TECHNOLOGY)**

VCE VET Units 1-2		
Code	Unit of competence	Nominal Hours
<b>Core</b>		
VBP118	Carry out a shared technology project	60
<b>Electives: select units to make up a minimum of 90 hours from at least two different specialisations</b>		
<b>Computer systems</b>		
VBP119	Perform basic network and computer assembly	30
VBP120	Perform basic network and computer maintenance	30
ICTTC136A	Install, maintain and modify customer premises communication cabling – ACA restricted rule	60
VBP122	Install and test a home entertainment system	30
<b>Wireless Communications</b>		
VBP123	Build a small wireless LAN	30
VBP124	Install and test a wireless intercom system	30
VBP126	Set up and operate a wireless communications link	30
<b>Energy Generation</b>		
VBP137	Assemble and connect an extra low voltage battery power source	30
VBP138	Maintain rechargeable battery systems	30
VBP139	Identify and locate building blocks of a centralised power generation system	30
VBP140	Set up an extra low voltage emergency power supply system (not exceeding 32V)	30
<b>Robotics and Embedded Controllers</b>		
VBP128	Set up and test an embedded control system	30
VBP129	Test and verify correct operation of a 'by-wire' control system	30
VBP131	Construct and configure a basic robotic system	30
<b>Photonics</b>		
ICTTC010C	Place, secure and terminate optical fibre cable	30
VBP135	Use photonic equipment in communications technology	30
<b>Subtotal</b>		<b>150-180</b>

**Note:** The two other core units of competence in the certificate are to be found in the Unit 3-4 sequence. However, delivery of the training for these two core units of competence should be conducted over the entire duration of the program.

VCE VET Units 3–4		
Code	Unit of competence	Nominal Hours
<b>Core</b>		
*UTENES050A	Identify and select components/accessories/materials for electrotech work activities	80
*UTENES056A	Apply technologies and concepts to electrotech work activities	100
<b>Select ANY two of the following electives:</b>		
<b>Computer System Networks</b>		
VBP121	Install and configure basic network and computer operating system	40
ICAITS032B	Provide network system administration	40
<b>Wireless Communications</b>		
VBP125	Conduct site survey for a wireless network	30
VBP127	Install communications antennae	30
<b>Energy Generation</b>		
VBP136	Operate a small power supply system	30
VBP141	Install a sustainable extra low voltage energy power system	30
<b>Robotics and Embedded Controllers</b>		
VBP130	Implement a digital circuit using a programmable logic device (PLD)	30
VBP132	Program a basic robotic system	30
<b>Photonics</b>		
VBP133	Plan and build a system using photonic equipment	30
VBP134	Use photonic equipment in engineering technology	30
		<b>Subtotal</b>
		<b>240–260</b>
		<b>TOTAL</b>
		<b>390–440</b>

\* *Note:* While these core units of competence form part of the Unit 3–4 sequence, delivery of the training should be spread over the entire program and formal assessment conducted in the year in which the student is enrolled in the Unit 3–4 sequence.

## SEQUENCE

In order for students to be able to satisfactorily complete the Unit 3–4 sequence in a single year, all the units of competence designated at Unit 3–4 level must be available to be undertaken in the same enrolment year.

However for:

- *UTENES050A Identify and select components/accessories/materials for electrotech work activities and*
- *UTENES056A Apply technologies and concepts to electrotech work activities*

it is expected that students will undertake the training for these units of competence over the length of the program, but the enrolment for these units should occur in the year in which the student is assessed for these units of competence. For students wishing to undertake scored assessment, these units of competence must be enrolled in as part of the 3–4 sequence.

Schools are advised that the Unit 3–4 sequence is not designed as a stand-alone study. The intention of VCE VET programs is to provide students with a qualification that meets industry expectations. The foundation knowledge and skills for the ability to function effectively in the workplace are often acquired in the early stages of the training program and are necessary for the achievement of competence in other areas of the program. A student may have great difficulty in achieving competence in the specified areas without first having undertaken training in the foundation or core units of competence. The strong advice and assumption of industry bodies is that the value of the training will be compromised unless based on the foundation skills specified by industry for each qualification.

## STUDY SCORE

A Study Score is available for Certificate II in Electrotechnology (Shared Technology) from 2006.

To be eligible for a Study Score students must:

- achieve all the units of competence designated as the Unit 3–4 sequence
- be assessed in accordance with the tools and procedures specified in the Electrotechnology Assessment Guide, published by the VCAA
- undertake an examination in the end-of-year examination period, based on the underpinning knowledge and skills in the units of competence advised by the VCAA.

## STRUCTURED WORKPLACE LEARNING (SWL)

The VCAA has determined that structured workplace learning is an appropriate and valuable component of all VCE VET programs. Structured workplace learning complements the training undertaken at the school/RTO. It provides the context for:

- enhancement of skills development
- practical application of industry knowledge
- assessment of units of competence, as determined by the RTO
- increase of employment opportunities and marketability.

The VCAA strongly recommends that students enrolled in this program undertake a minimum of 30 hours structured workplace learning.

While structured workplace learning is not limited to an electrotechnology job site, it is highly desirable that students gain experience in an electrotechnology workshop or workplace. A range of industry settings may provide useful and appropriate contexts for industry familiarisation. The following industry settings could provide students with the workplace context to enhance their acquisition of skills and knowledge:

- electronics entertainment
- wireless systems
- sales and technical support for computer and electronic equipment
- energy generation
- computer network support.

The school/RTO should keep evidence of the student's structured workplace learning, which may take place over weekends and during school holidays as well as during the school week.

Under the new SWL arrangements outlined in Ministerial Order 23, students undertaking SWL must first complete the Occupational Health and Safety (OH&S) training relevant to the workplace before commencing their SWL placement. In the situation where assessment of OH&S units of competence is conducted in the workplace, all training up to assessment stage must be completed before the student commences SWL.

The Certificate II in Electrotechnology (Shared Technology) has no specific unit of competence for occupational health and safety. The requirements for OH&S in this certificate are embedded in each unit of competence.

General OH&S requirements are listed in the three core units of competence in the qualification and may be appropriate for a wide variety of industry settings. These general OH&S requirements can be found in the performance criteria. The RTO must ensure that students are ready and able to be assessed against the following in order to meet SWL requirements:

- *VBP118 Carry out a shared technology project*, performance criteria elements 1, 2 and 3
- *UTENES050 A Identify and select components/accessories/materials for Electrotech work activities*, performance criteria elements 1 and 2
- *UTENES056A Apply technologies and concepts to Electrotech work activities*, performance criteria elements 1 and 2.

For specific industry sector OH&S requirements schools/RTOs must refer to the relevant industry specialisation units of competence in the course accreditation document. These requirements are detailed under the sub headings Performance Criteria, Range of Variables and Evidence Guide.

### Local community partnerships

‘SWL has grown rapidly in recent years. So that industry is not overwhelmed with requests, clusters of government and non-government schools work together with business to maximise the benefits of SWL. Clusters usually operate through a 'local community partnership' which employs staff specifically to coordinate placements and monitor their quality. Local community partnerships are often incorporated bodies with a board of management with representatives from education, industry and the community. The partnerships previously funded through the Enterprise and Career Education Foundation are now funded and managed by the Australian Government Department of Education, Science and Training. There are over 200 partnerships across Australia.

The Curriculum Corporation website provides support for SWL programs including case studies: [www.curriculum.edu.au](http://www.curriculum.edu.au)’

Sourced from the Department of Education, Science and Training website: [www.dest.gov.au](http://www.dest.gov.au)

### OCCUPATIONAL HEALTH AND SAFETY

Schools/RTOs must ensure that occupational health and safety issues are fully addressed in the training program. To assist the principal in meeting the school’s responsibilities for students in structured workplace learning, delivery of the OH&S aspects of training within the units of competence in the training program must be undertaken before students begin their structured workplacement.

In particular, attention is drawn to the following extract from the course accreditation document, page 6: ‘Note: The Electrotechnology Industry is a hazardous industry which is demonstrated by the need for regulation in respect of electrical safety and regulation, and therefore, due regard must be given to the environment in which the development of underpinning knowledge and skills and its application occurs. In particular, special attention is to be given to the topic of Electrotechnology Systems, Materials and Accessories\*. Appropriate measures for this topic must be put in place to ensure a structured environment that is designed for instructional purposes, and which does not expose the learner to any voltages that exceed extra low voltage. Extra low voltage is defined in Standards Australia publications, e.g. SA/NZ 3000:2001. However, the use of such equipment does not negate the duty of care in treating electricity other than a hazard.’

\* Details of the topics to be covered are listed in the underpinning knowledge and skills in *UTENES050A Identify and select components/accessories/materials for Electrotech work activities*.

The following information is provided by the Office of the Chief Electrical Inspector and relates to electrical safety requirements for the delivery of the VCE VET Certificate II in Electrotechnology (Shared Technology) program:

'In Victoria, the relevant legislation for electrical safety is the Electricity Safety Act 1998 and associated regulations. Only persons who hold an appropriate current electrical licence are permitted to carry out electrical work on products or equipment that require voltage greater than 50 volts a.c. or 120 volts ripple-free d.c. This requirement means that students are not permitted to carry out any electrical work on electrical products or equipment that operates above 50 volts a.c. or 120 volts ripple-free d.c.

Students are permitted to work with approved apparatus, appliances and testing equipment that operate at voltages up to 240 volts (which may include appliances such as electrical drills or electrical soldering irons); however they must not access or modify any component on such apparatus or appliance.

Any product that requires voltages up to 50 volts a.c. or 120 volts d.c. in a supervised class must comply with Wiring Rules (AS/NZS 3100:2002).

It should also be noted that Occupational Health and Safety legislation requires testing and tagging of electrical leads, which is required to be carried out by a competent person in accordance to AS/NZS 3760.'

Students must be informed of the significance of work related hazards. They must understand the need for, and the nature of, workplace risk controls such as safe working procedures and the use of personal protective clothing.

Schools must also be satisfied, through their review of the acknowledgement provided by employers in the SWL Arrangement Form, that the workplace in question and the activities proposed will not expose a student to risk during their structured work placement.

Employers must view their duty of care toward students as essentially no different from that owed to their employees. They must understand that students cannot be expected to possess the judgment or maturity to undertake any task which presents potential risk. This means that no student may be exposed at any time to dangerous plant, equipment, substances, work environments or work practices.\*

On their first morning of placement, students should be introduced to their supervisor and provided with a formal induction to the workplace. This will include first aid, emergency and incident reporting arrangements. The student should be given an orientation tour of the workplace and any excluded areas or activities should be pointed out.

Close supervision of students undertaking SWL is essential. Supervisors nominated by the employer must understand all requirements for safely managing the student's activities.

These websites may provide useful resources for schools/RTOs:

[www.worksafe.vic.gov.au/dir090/vwa/home.nsf/pages/worksafe\\_home](http://www.worksafe.vic.gov.au/dir090/vwa/home.nsf/pages/worksafe_home)

[www.ohs.labour.net.au/youthsafe/safety\\_first/index.html](http://www.ohs.labour.net.au/youthsafe/safety_first/index.html)

\* Employers should be provided with the Department of Education and Training Structured Workplace Learning Guidelines for Employers, which sets out their responsibilities and provides information to assist them with induction and supervision of students. This is available on the Sofweb website: [www.sofweb.vic.edu.au](http://www.sofweb.vic.edu.au)

## Recognition within the VCE

### VCE VET UNIT ENTITLEMENT

The Certificate II in Electrotechnology (Shared Technology) provides a Unit 3–4 sequence for satisfactory completion purposes.

Students are eligible for credit of up to four VCE VET units on their VCE Statement of Results: two units at Unit 1–2 level and a Unit 3–4 sequence.

Students may accumulate VCE VET units over more than one year.

### DUPLICATION

VCE VET units may only make the maximum available contribution towards satisfactory completion of the VCE where no significant duplication exists between the VCE VET program and VCE studies or another VCE VET certificate in a student's program. Where significant duplication does exist, students may enrol in the VCE VET program and the VCE studies or other VET certificate identified, but a reduced VCE VET unit entitlement will then apply.

Significant duplication has been identified between components of the Certificate II in Electrotechnology (Shared Technology) and VCE Systems and Technology.

Where students have completed:

- any two units of Systems and Technology and
- Certificate II in Electrotechnology (Shared Technology)

the VCE VET unit entitlement for Certificate II in Electrotechnology (Shared Technology) will be one VCE VET unit at 1–2 level and two VCE VET units at 3–4 level.

### Separate assessment processes

While there is potential for the integrated delivery of elements of the VCE VET Electrotechnology (Shared Technology) program with other VCE studies, providers must ensure that students undertake separate assessments in order to meet the VET requirements as distinct from VCE outcomes.

Where a student is enrolled in both the VCE VET Electrotechnology (Shared Technology) program and a related VCE study, separate collections of evidence conforming to the assessment criteria in each study must be able to be demonstrated.

Importantly, assessment of the VET units of competence must be conducted to meet industry standards. The Performance Criteria, Evidence Guide and Range of Variables/Range Statement in each unit of competence specify work activities that require a suitable industry context, whether real or simulated. The assessment of competence relies on the collection of evidence that demonstrates the application of skills and knowledge to workplace tasks.

A student must not submit the same piece of work for assessment in more than one study.

### **EQUIVALENT NATIONAL TERTIARY ENTRANCE RANK (ENTER)**

The ENTER is calculated by the Victorian Tertiary Admissions Centre (VTAC), subject to satisfactory completion of the VCE and using the study scores students have received for a specified set of VCE studies.

The contribution of the VCE VET Electrotechnology (Shared Technology) program to the ENTER is as follows:

- Any contribution to the ENTER is subject to satisfactory completion of the Unit 3–4 sequence.
- A Study Score is available for this program in 2006. The Study Score will contribute directly to the ENTER, either as one of the student's best four studies ('the primary four') or as a fifth or sixth study.
- A contribution to the ENTER is subject to receiving a Study Score.
- Students may choose not to receive a Study Score, but in that case will not be eligible for any ENTER contribution.

For further information on the calculation of the ENTER, refer to the VTAC website:

[www.vtac.edu.au](http://www.vtac.edu.au)



## **Recognition within the VCAL**

The Certificate II in Electrotechnology (Shared Technology) is available for students who are enrolled in the VCAL.

The contribution of the Certificate II in Electrotechnology (Shared Technology) to a student's VCAL program is determined by the number of units of competence completed. Each 100 hours of training will contribute one unit towards satisfactory completion of a student's VCAL program. The Certificate II in Electrotechnology (Shared Technology) will satisfy learning outcomes for the Industry Specific Skills and Work Related Skills strands.

The Certificate II in Electrotechnology (Shared Technology) may contribute to the VCAL at the Foundation, Intermediate or Senior level.

## Delivery and assessment

VCE VET programs function within the AQTF, so that students may be eligible for nationally recognised qualifications or gain credit toward those qualifications.

### ROLE OF REGISTERED TRAINING ORGANISATIONS

Under the AQTF, all quality assurance requirements in relation to training delivery, assessment and certification are the responsibility of RTOs. RTOs are responsible for issuing qualifications and Statements of Attainment.

The AQTF has a number of requirements of RTOs including the following:

- documented systems for quality training and assessment
- conduct of an internal audit at least annually
- documented agreements with other organisations when they provide training or assessment in partnership
- written procedures for recruitment, induction and professional development of staff, as well as induction programs
- use of trainers and assessors with specified competencies
- explicit requirements for quality assurance in assessment.

The detailed standards for RTOs under the AQTF are available from the following website: [www.anta.gov.au/aqtfStandards.asp](http://www.anta.gov.au/aqtfStandards.asp)

In particular, Standard 7.4 addresses the issue of suitably competent staff to deliver training:

‘The RTO must ensure that training is delivered by a person who:

- i. has all the competencies in the Certificate IV from the Training Package for Assessment and Workplace Training (or has demonstrated the equivalent competencies) or who is under direct supervision\* of a person with these competencies; and
- ii. is able to demonstrate vocational competence at least to the level of those being delivered.

*\*Direct supervision is achieved when a person delivering training on behalf of the RTO has regular guidance, support and direction from a person designated by the RTO who has the competencies in Standard 7.4 (i) and who monitors and is accountable for the training delivery. It is not necessary for the supervising person to be present during all the training delivery.’*

RTOs may be TAFE institutes, private providers, group training companies, industry organisations, schools and enterprises.

Assessment may be conducted only by, or under the auspices of, an RTO. Cooperative arrangements may be established between schools and RTOs for the delivery and assessment of components of a training program. A school not registered as an RTO but intending to deliver training must do so under the auspices of an RTO.

Schools need to be assured that training providers are registered before entering an arrangement. A list of RTOs is available from Department of Education and Training regional offices, OTTE or the National Training and Information Service: [www.ntis.gov.au](http://www.ntis.gov.au)

For further information refer to ‘Registration’, on page 23.

## DELIVERY OPTIONS

Schools may consider two options for the delivery of VCE VET programs.

### Option 1: School and RTO partnerships

School and RTO partnerships may work in the following ways:

- shared delivery
- delivery on behalf of the school by the RTO
- delivery by the school of the whole program, under the auspices of the RTO.

Schools can negotiate with an RTO to deliver components of the program, where the school can demonstrate access to suitable staffing and resources. The RTO may also auspice the school to gather evidence for assessment or to conduct assessment of the components delivered by the school.

A school in partnership with an RTO is not required to register as a training organisation, because any delivery by the school will be auspiced by the RTO.

A school may arrange for an RTO to deliver and assess the entire program.

Schools are responsible for enrolling their students with the VCAA and for entering student results on the Victorian Assessment Software System (VASS) according to VCAA timelines.

### Option 2: Schools as RTOs

Schools may apply to the OTTE through a Training Recognition Consultant to become an RTO for the provision of specified qualifications. A summary of registration requirements and contact details for registration are provided on page 23.

Schools that register to deliver training become responsible for all elements of delivery, assessment and quality assurance, as well as the awarding of Certificates and Statements of Attainment.

A school registered as an RTO is responsible for enrolling its students with the VCAA in the relevant certificate and units of competence and for entering results on VASS when units of competence have been achieved. The school is also responsible for provision of enrolment, results and other data within the training sector.

## DELIVERY IN SCHOOLS

Two modes of delivery are possible in the school context:

1. The delivery may be conducted through separate, timetabled classes dedicated to VET training, where there are enough students enrolled in the specific VCE VET program.
2. The school may timetable the delivery of training within the time allocated to one or more VCE studies which provide an appropriate delivery setting for the VET training. Students need not necessarily be enrolled in the VCE studies. This is most suited to provision for a small group of students wishing to undertake a VET certificate. The school must ensure that the VET training requirements are met separately from the VCE outcomes. The assessment tasks and evidence of achievement of units of competence must be separately demonstrated and recorded.

This option may work in two ways:

- The VCE studies may offer an appropriate delivery setting for achievement of the units of competence. Some aspects of both the VCE and VET may be integrated, while others may have to be delivered through separate learning activities.

- Where there is a high degree of comparability between the VET competencies and the VCE unit outcomes, the delivery of the VET training may be integrated with the VCE study. Students must undertake separate assessments in order to meet the VET requirements and VCE outcomes. The gathering of evidence for the achievement of units of competence may occur within the school if the RTO partner is satisfied that the school has the necessary resources and expertise.

It is the responsibility of the RTO to ensure that all units of competence required for a particular VET qualification are achieved to the standard specified by the performance criteria, and are assessed according to the assessment guidelines specified in each unit of competence.

It is possible for providers to deliver the training programs in an appropriately simulated environment, as long as the contexts for assessment as described in the course accreditation document are complied with.

**Note:** When simulations are used for assessing competence, it is vital that they are set up to reflect real activities and conditions. Simulations must be devised, set up and operated with care, as simulations are a source of performance evidence of how the activity was carried out. The costs of setting up a valid simulation can be considerable, therefore simulations should not be considered an inexpensive alternative.

Some elements of units of competence may be best delivered and assessed in the workplace. This may be facilitated through structured workplace learning arrangements or projects.

The following table provides advice on the VCE studies that may provide an appropriate context for delivery of some components of the VET training. Information provided is based on current practice. All such arrangements are subject to agreement with the RTO responsible for issuing the certificate. Schools may negotiate with RTOs to deliver other components of the training within VCE resources, if training and quality assurance requirements can be met. The RTO remains responsible for assessment (refer to page 17 under 'Assessment').

Unit of competence		Appropriate delivery context
VBP135	Use photonic equipment in communications technology	VCE Physics
VBP133	Plan and build a system using photonic equipment	
VBP139	Identify and locate building blocks of a centralised power generation system	
<i>The following study provides an appropriate delivery context but may involve reduced unit entitlement (See duplication details under 'Recognition within the VCE' page 11)</i>		
VBP128	Set up and test an embedded control system	VCE Systems and Technology
VBP129	Test and verify correct operation of a 'by-wire' control system	
VBP131	Construct and configure a basic robotic system	
VBP130	Implement a digital circuit using a programmable logic device (PLD)	
VBP132	Program a basic robotic system	

## DELIVERY IN THE WORKPLACE

Schools and RTOs may arrange for delivery of training and assessment to occur in the workplace.

If a school or RTO wishes particular components of the training to be delivered and outcomes assessed in the workplace, the following industry requirements apply:

- Delivery and assessment strategies and relevant responsibilities should be clearly communicated to all parties (school, RTO, employer and student) to ensure that all roles in the delivery and assessment process are understood.
- There is appropriate workplace supervision and training in relation to the specific units of competence delivered in the workplace.
- The person responsible for the structured workplace learning must have competence at the certificate level being delivered or higher.
- Assessment in the workplace requires a qualified Workplace Assessor with relevant industry experience, or the assessment may be conducted by a Workplace Assessor in cooperation with the workplace supervisor.

## ASSESSMENT

Competency standards have specific requirements regarding demonstration of competence and appropriate assessment of competence. These requirements are detailed in each unit of competence under the sub-headings Performance Criteria, Range of Variables and Evidence Guide. Teachers should give careful consideration to the details of these sections when planning programs.

Assessment of units of competence is the responsibility of the RTO. A school that is not an RTO may be auspiced by an RTO to conduct the assessments, either in an appropriate simulated environment or in conjunction with the supervisor in the workplace.

For further information, refer to AQTF Standard 7. A copy of the Standards can be downloaded from the AQTF website: [www.anta.gov.au/aqtfStandards.asp](http://www.anta.gov.au/aqtfStandards.asp)

In particular, Standard 7.3 addresses the issue of suitably competent staff to conduct assessments:

‘The RTO must ensure that assessments are conducted by a person who has:

- i. the following competencies from the Training Package for Assessment and Workplace Training, or demonstrated equivalent competencies:
  - a BSZ401A Plan Assessment
  - b BSZ402A Conduct Assessment
  - c BSZ403A Review Assessment; and
- ii. relevant vocational competencies, at least to the level being assessed.’

## Resources

The following table provides advice on the resources currently available to support delivery of the VCE VET program.

Unit of competence	Resource
VBP118 Carry out a shared technology project	<ul style="list-style-type: none"> <li>• Build, setup and program a Tracking Robot with a Bluetooth remote-control link to a PDA or mobile phone</li> <li>• <i>Elektronics</i> magazine article September 2004 pages 48–55 <a href="http://www.elektor-electronics.co.uk/dl/dl.htm">www.elektor-electronics.co.uk/dl/dl.htm</a></li> </ul>
UTENES050A Identify and select components/ accessories/materials for electrotech work activities VBP119 Perform basic network and computer assembly VBP120 Perform basic network and computer maintenance	Cisco Academy IT Essentials I curriculum can be used as a learning support material.
VBP123 Build a small wireless LAN VBP125 Conduct site survey for a wireless network VBP127 Install communications antennae	<ul style="list-style-type: none"> <li>• 802.11 wireless LANs D-Link or similar</li> <li>• <i>Silicon Chip</i> article November 2002 pages 66–71: 'Wi-Fi: 21st Century Cat's Whiskers'</li> <li>• <i>Silicon Chip</i> article August 2003 pages 42–48: 'Home-Brew Weatherproof 2.4GHz WiFi Antennas'</li> <li>• <i>Silicon Chip</i> article September 2004 pages 14–17: 'WiFry: Cooking up 2.4GHz Antennas'</li> </ul>
VBP 126 Set up and operate a wireless communications link VBP127 Install communications antennae	<ul style="list-style-type: none"> <li>• Experiments in <i>Silicon Chip</i>: <a href="http://www.siliconchip.com.au">www.siliconchip.com.au</a></li> <li>• Commlinx Solutions P/L <a href="http://www.commlinx.com.au">www.commlinx.com.au</a> TLP434A Ultra Small Transmitter RLP434A SAW Based Receiver</li> </ul>
VBP128 Set up and test an embedded control system VBP131 Construct and configure a basic robotic system VBP132 Program a basic robotic system	PicAxe Microcontrollers – designed for educational purposes Australian distributor: MicroZed Computers PO Box 634 Armidale NSW 2350 Tel: (02) 6772 2777 Fax: (02) 6772 8987 Mob: 0438 277 634 <a href="http://www.microzed.com.au">www.microzed.com.au</a>
VBP130 Implement a digital circuit using a programmable logic device (PLD)	Programmable logic devices Australian distributor for Altera: Braemac <a href="http://www.braemac.com.au/">www.braemac.com.au/</a>

Unit of competence	Resource
VBP136 Operate a small power supply system VBP137 Assemble and connect an extra low voltage battery power source VBP138 Maintain rechargeable battery systems VBP139 Identify and locate building blocks of a centralised power generation system VBP141 Install a sustainable extra low voltage energy power system	<ul style="list-style-type: none"> <li>• Battery power sources for remote-control and portable devices and mobile robots</li> <li>• Solar, wind and fuel cell energy supplies</li> <li>• Jaycar Electronics: Operating fuel cell powered car with multiple experiments (Stock Code KT2500) RRP \$299 (much cheaper for education institutions)</li> <li>• Jaycar Electronics: Alternative energy model house with experiments (Stock Code KT2502) RRP \$299</li> <li>• Alternative Technology Association: www.ata.org.au publisher of <i>Renew</i> magazine featuring renewable energy, water conservation, sustainable building and technology for a sustainable future</li> <li>• CERES Community Environment Park, 8 Lee Street, East Brunswick, VIC www.ceres.org.au</li> <li>• <i>Silicon Chip</i> magazine: www.siliconchip.com.au</li> </ul>
VBP133 Plan and build a system using photonic equipment VBP134 Use photonic equipment in engineering technology VBP135 Use photonic equipment in communication technology	Laser light projects Account and Operations Manager Senko Advanced Components www.senko.com
Additional product information	
Robot supplies	Lynxmotion www.lynxmotion.com/  Australian distributor RobotOz PO Box 635 Inglewood WA 6932 Tel: (08) 9370 3456 Fax: (08) 9370 2323 Email: kits@robotOz.com.au Website: www.robotOz.com.au
Shape memory alloys	Muscle wires Project book ISBN 1-879896-13-3 Available from RobotOz
Distributor for Altronics and Microzed	School Electronics Supplies PO Box 636 Heathmont VIC 3135 Ph: (03) 8802 0628 Fax: (03) 88020629 (specialist supplier for schools electrotechnology programs)

# Administration

## ENROLMENTS

It is the responsibility of the student's home school to administer the VCE VET program and all aspects of VCE VET enrolment and results on VASS. A student must be enrolled in all units of competence by the home school, regardless of where the training is delivered and competence assessed.

Schools must enrol students in the VCE VET program as follows:

1. Enrol all students undertaking the program in 21583VIC Certificate II in Electrotechnology (Shared Technology).
2. Enrol students in the units of competence they are expecting to achieve in that year. If a student does not achieve a unit of competence and wishes to continue in a following year, the student must be re-enrolled in that year.
3. Ensure that students expecting to satisfactorily complete a Unit 3–4 sequence in that year have been enrolled in the units of competence comprising the Unit 3–4 sequence.

For further information on undertaking a Study Score in 2006, schools are referred to the *Electrotechnology Assessment Guide* to be published by the VCAA.

Schools do not need to enrol students in VCE VET units. Enrolment or withdrawal of a student from a VCE VET unit occurs automatically via enrolment in or withdrawal from the units of competence.

## RECORDING RESULTS

### Achievement of units of competence

To achieve a unit of competence, a student must be assessed competent for all the elements of that unit. Schools are required to record the student's achievement of all units of competence on VASS.

Results must be entered on VASS in time to meet the VCAA deadlines. Refer to the current VCE and VCAL Administrative Handbook for the due date. It is the responsibility of the home school to ensure that all results from other providers are accurate and received in time to be entered on VASS.

Schools and RTOs must ensure that records are kept of individual student achievement for all units of competence in the program.

## VCE VET UNIT COMPLETION

Enrolment in units of competence automatically leads to enrolment in VCE VET units. As units of competence are recorded as completed, completion of VCE VET units is automatic.



## **REPORTING**

VCE VET units are reported on the student's VCE or VCAL Statement of Results, together with other VCE or VCAL units completed. Students will also receive from the VCAA a separate VCE VET Statement of Results listing all units of competence achieved.

The student receives 'S' for each unit of competence achieved. The VET Statement of Results includes only units of competence for which the student has been awarded an 'S'.

## **CERTIFICATION**

Students who complete all the requirements of a program will be awarded a certificate by the RTO. Partial completion is recorded on a Statement of Attainment issued by the RTO.

## Articulation and pathways

The Certificate II in Electrotechnology (Shared Technology) reflects the new trends emerging as a result of the convergence of information and communications technology (ICT) and electronics technologies and their applications in industry.

The skill areas for future workers within the electrotechnology industry are the:

- use and management of computer networks
- manipulation of wireless communications
- ability to analyse the amounts of data collected by smart devices and
- closer involvement in electricity generation.

The Certificate II in Electrotechnology (Shared Technology) articulates into the electrotechnology, information technology and telecommunications training pathways.

This qualification also provides a springboard into a diverse range of related industries sharing technologies with the electrotechnology industry. Industries that are likely to share different types of technologies are the ones that use and apply electronic devices to products and services. These industries include automotive, building and construction, electrical, electronics, engineering, information technology and telecommunications.

Depending on the electives undertaken, graduates will have enhanced employment prospects across a range of technical activities. Specifically, a graduate of this course may articulate into apprenticeships or traineeships or into pre-apprenticeships such as the Pre-apprenticeship Electrical Program.

The Certificate II in Electrotechnology (Shared Technology) also provides a pathway into an electrotechnology apprenticeship in areas such as Assembly and Servicing and Systems Electrician.

Depending on the selection of other VCE subjects, graduates of the Certificate II in Electrotechnology (Shared Technology) may enrol in higher qualifications such as Advanced Diplomas in Electrotechnology or Information Technology.

# Registration

Under the AQTF, only RTOs may issue VET qualifications.

In order to comply with these arrangements, a school offering VCE VET programs has two options: to form a partnership with an RTO, or to register through OTTE as an RTO in its own right.

Registration of training organisations in Victoria is the responsibility of the VQA. RTOs are subject to guidelines and procedures promulgated by the VQA, which are administered by OTTE.

If a school elects to become an RTO, OTTE registration requirements must be met. There are two elements to the registration requirements:

- qualification-specific information (teacher qualifications, facilities, equipment)
- infrastructure (including reporting and recording systems, codes of practice, grievance procedures, policies for Recognition of Current Competence/Prior Learning).

The application form for RTO registration and conditions of registration are available from:

VET Provider Registration Branch

Office of Training and Tertiary Education.

Tel: (03) 9637 2762

Fax: (03) 9637 2520

Website: [www.otte.vic.gov.au](http://www.otte.vic.gov.au)

## Useful contacts and information sources

### Course accreditation document

Schools intending to offer the VCE VET Electrotechnology program are required to use the course accreditation document for 21583VIC Certificate II in Electrotechnology (Shared Technology).

The course accreditation document provides the details on certificate completion requirements and each unit of competence and assessment requirements. Schools may obtain the course accreditation document and training and assessment support materials from:

### Curriculum Maintenance Manager – Engineering Industries – Electrical/Electronics

Mr George Adda  
Box Hill Institute of TAFE  
465 Elgar Road  
BOX HILL VIC 3128  
Tel: (03) 9286 9880  
Fax: (03) 9286 9800  
Email: g.adda@bhtafe.edu.au

Further information may also be available from:

### EPIC Industry Training Board

29 Drummond Street  
CARLTON VIC 3053  
Tel: (03) 9654 1299  
Fax: (03) 9654 5299

### Other sources of implementation advice

The following is a list of contacts for additional information and advice.

### Australian Training Products

Level 25, 150 Lonsdale Street  
MELBOURNE VIC 3000  
Tel: (03) 9655 0600  
Fax: (03) 9639 4684  
Email: sales@atpl.net.au  
Website: www.atpl.net.au

### **TAFE Frontiers**

Level 3 620 Bourke Street  
MELBOURNE VIC 3000  
Tel: (03) 9670 8123  
Fax : (03) 9670 8125  
Website: [www.tafefrontiers.com.au](http://www.tafefrontiers.com.au)

### **VCE VET program structure**

Victorian Curriculum and Assessment Authority  
Vocational Education – Curriculum Branch  
Tel: (03) 9651 4458  
Fax: (03) 9651 4324  
Email: [vct.vcaa@edumail.vic.gov.au](mailto:vct.vcaa@edumail.vic.gov.au)  
Website: [www.vcaa.vic.edu.au/vet](http://www.vcaa.vic.edu.au/vet)

### **VCAL program structure**

Victorian Curriculum and Assessment Authority  
VCAL Unit – Curriculum Branch  
Tel: (03) 9651 4532  
Fax: (03) 9651 4324  
Email: [vct.vcaa@edumail.vic.gov.au](mailto:vct.vcaa@edumail.vic.gov.au)  
Website: [www.vcaa.vic.edu.au/vet](http://www.vcaa.vic.edu.au/vet)

### **Student enrolment**

Victorian Curriculum and Assessment Authority  
VASS Unit  
Hotline (metro): (03) 9651 4482  
Hotline (country): 1800 827 721  
Fax: (03) 9651 4324  
Email: [vass.support@edumail.vic.gov.au](mailto:vass.support@edumail.vic.gov.au)

### **VCE certification/eligibility**

Victorian Curriculum and Assessment Authority  
Student Records and Results Unit  
Hotline (metro): (03) 9651 4402  
Hotline (country): 1800 653 045  
Fax: (03) 9651 4324

### **VET certification/eligibility**

The RTO is responsible for certification.

### **Program support**

Post Compulsory Pathways Branch  
Office of Learning and Teaching  
Department of Education and Training  
Tel: (03) 9637 2314  
Fax: (03) 9637 2160  
Website: [www.sofweb.vic.edu.au](http://www.sofweb.vic.edu.au)

**Registration**

VET Provider Registration Branch

Office of Training and Tertiary Education

Tel: (03) 9637 2762

Fax: (03) 9637 2520

Website: [www.otte.vic.gov.au](http://www.otte.vic.gov.au)

**Tertiary entrance requirements**

Victorian Tertiary Admissions Centre

Tel: 1300 364 133

Website: [www.vtac.edu.au](http://www.vtac.edu.au)

**Victorian Curriculum and Assessment Authority publications**

The *VCAA Bulletin* (published monthly excluding January) provides administrative information and documents developments in VET in the VCE. Schools should ensure relevant information is circulated to appropriate staff and distributed to RTO partners.

VCE and VCAL Administrative Handbook (for the current year)

Also refer to VASS Help Screens for advice

# Glossary

## **Auspice**

A process whereby an RTO authorises delivery and/or assessment to be carried out by industry, individual enterprises or schools.

## **Australian Quality Training Framework (AQTF)**

A set of nationally agreed standards ensuring the quality of vocational education and training services throughout Australia. Includes processes for registering training organisations as a quality assurance mechanism for the training system.

## **Australian Qualifications Framework (AQF)**

The Australian Qualifications Framework is set of descriptors that determine the level of the qualification. The level depends on the depth and complexity of the work and the degree of autonomy involved.

## **Competency standards**

Competency standards are statements that define the skills and knowledge needed for effective work performance at the standard required in the workplace. These standards have been agreed nationally by industry advisory bodies across Australia and are part of the national training packages endorsed by ANTA. The standards define the required training outcomes and outline what must be demonstrated before a candidate may be assessed competent.

## **Curriculum Maintenance Managers (CMMs)**

The role of the CMM is to maintain the stock of Victorian Crown copyright curriculum and to provide advice on training packages. The CMM's function is carried out by staff located within TAFE institutes in Victoria. They are recognised as officers of OTTE.

## **Industry Skills Councils (formerly Industry Training Advisory Bodies – ITABs)**

Industry Skills Councils support the development and implementation of training products, including training packages and provide the VET sector with information on current and future skill needs and training requirements.

## **National Training Framework**

This is the system of vocational education and training that applies nationally. It is comprised of the Australian Quality Training Framework and nationally endorsed training packages.

## **Office of Training and Tertiary Education (OTTE)**

OTTE is responsible for the planning, regulation and delivery of a range of education and training programs and services in Victoria.

## **Registered Training Organisation (RTO)**

A nationally recognised provider of training registered with the relevant State/Territory Training Authority (in Victoria through the VQA).

### **Training package**

A set of documents that sets out the training framework determined by industry for an industry sector. National competency standards, assessment guidelines and national qualifications form the endorsed components of training packages. Assessment materials, learning strategies, and professional development materials may support these as non-endorsed components.

### **Unit of competence**

A distinct work performance specified in terms of what should be done and the standard to which it must be performed, as required in industry. Units of competence are divided into elements, each with performance criteria and a guide to the evidence on which assessment of competence should be based.

### **Victorian Assessment Software System (VASS)**

An Internet-based system used by schools to enter VCE and VCAL enrolments and results directly onto the VCAA central database.

### **VCE unit**

A unit of study within the VCE, normally undertaken over one school semester and contributing towards the satisfactory completion of the VCE.

### **VCE VET unit**

A group of VET units of competence or curriculum based modules deemed to be equivalent to one VCE unit.

### **Vocational Education and Training (VET)**

A generic term, applying both to the training sector generally and to a variety of forms of post-compulsory education and training, which focuses on the development of work-related competencies that provide pathways into employment and further training.

### **VET in the VCE**

A set of vocational certificates approved by the VCAA as appropriate for delivery within a school's VCE program. This is part of the Victorian implementation of a national initiative, VET in Schools, supporting the provision of vocational education and training programs for secondary school students.

### **Victorian Qualifications Authority (VQA)**

The Victorian Qualifications Authority is responsible for all qualifications issued in Victoria, the registration of training providers and accreditation of all post-compulsory courses except higher education courses.