

<b>Title</b>	<b>Demonstrate electronic printed circuit board layout skills</b>		
<b>Level</b>	<b>4</b>	<b>Credits</b>	<b>5</b>

<b>Purpose</b>	<p>This unit standard covers the introductory design and development of PC boards.</p> <p>People credited with this unit standard are able to:</p> <ul style="list-style-type: none"> <li>- demonstrate knowledge of printed circuit board materials and manufacturing process;</li> <li>- interpret electronic circuit design information in preparation for creation of printed circuit board layout; and</li> <li>- create a printed circuit board layout using CAD technology.</li> </ul>
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<b>Classification</b>	Electronic Engineering > Core Electronics
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<b>Available grade</b>	Achieved
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**Guidance Information**

- 1 This unit standard is intended for use in engineering courses at diploma level with assessment primarily against laboratory assignments.
- 2 Reference  
Health and Safety in Employment Act 1992;  
and all subsequent amendments and replacements.
- 3 Definitions  
*CAD* – computer aided design.  
*Drawing entity* – items such as symbols, lines, arcs, circles, text or dimensions that comprise a drawing.  
*PCB* – printed circuit board.  
*Surface mount devices (SMD)* – components that are directly bonded to a PCB.
- 4 Evidence for the elements of this unit standard must be presented in the form of a set of drawings for the layout of a double sided PCB containing both conventional and SMD components.
- 5 All measurements are to be expressed in Système International (SI) units, and, where required, converted from Imperial units into SI units.
- 6 All activities must comply with: any policies, procedures, and requirements of the organisations involved; the standards of relevant professional bodies; and any relevant legislative and/or regulatory requirements.

- 7 Range
- a performance in relation to the elements of this unit standard must comply with the Health and Safety in Employment Act 1992;
  - b laboratory and workshop safety practices are to be observed at all times.

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## Outcomes and performance criteria

### Outcome 1

Demonstrate knowledge of printed circuit board materials and manufacturing process.

#### Performance criteria

- 1.1 Commonly used PCB laminates in industry are discussed.
- Range may include but is not limited to – FR2, FR3, FR4, CEM1, CEM3.
- 1.2 Printed circuit board design is explained in terms of the impact of imaging and etching methods.
- Range may include but is not limited to – pad sizes, pad and track clearances, track widths.

### Outcome 2

Interpret electronic circuit design information in preparation for creation of printed circuit board layout.

#### Performance criteria

- 2.1 Factors that are significant to the PCB layout are explained.
- Range factors may include but are not limited to – electrical, electronic, signal and power tracking constraints; component selection requirements; enclosures; PCB manufacturing; assembly and testing requirements.
- 2.2 Methods of addressing the factors identified in performance criterion 2.1 that affect the PCB layout are described.
- Range factors may include but are not limited to – track widths, pad sizes, clearances, input/output, multi-layer techniques, PCB assembly, mounting and testing.

### Outcome 3

Create a printed circuit board layout using CAD technology.

**Performance criteria**

- 3.1 Printed circuit board artwork is produced to PCB industry standards for a given electronic drawing.

Range evidence of PCB artwork drawing suitable for manufacture.

**This unit standard is expiring. Assessment against the standard must take place by the last date for assessment set out below.**

**Status information and last date for assessment for superseded versions**

Process	Version	Date	Last Date for Assessment
Registration	1	27 April 2000	31 December 2024
Review	2	18 December 2006	31 December 2024
Review	3	24 August 2023	31 December 2024

**Consent and Moderation Requirements (CMR) reference**

0003

This CMR can be accessed at <http://www.nzqa.govt.nz/framework/search/index.do>.