

## National Certificate in Engineering and Technology (for the Design and Construction Sector) (Level 4)

**Level** 4

**Credits** 60

### Purpose

This introductory qualification is for people considering a career at the technician level in the sectors covered by the Design and Construction industry. It recognises a wide range of knowledge and skills to enable learners to choose unit standards that will lead onto further qualifications in the Design and Construction sector.

The breadth of choices for this qualification allows the unit standards credited towards this qualification to provide the underpinning knowledge and skills for the National Diplomas in Architectural Technology, Civil Engineering, Construction Management, Design, Quantity Surveying, and Surveying. Thus the qualification is very flexible and has a high degree of portability.

This qualification also incorporates unit standards from the National Certificate in Design (Introductory Skills) (Level 2) [Ref: 0461] and the National Certificate in Design (Level 3) [Ref: 0462]. This will allow the relevant unit standards credited towards these qualifications to also be credited to this one: the National Certificate in Engineering Technology (for the Design and Construction Sector) (Level 4).

### Credit Range

	<b>Elective</b>
Level 2 credits	0-20
Level 3 credits	0-20
Level 4 or above credits	40-60
Minimum total	60

### Requirements for Award of Qualification

This qualification will be awarded to people who have achieved a minimum of 60 credits of which 40 credits are at level 4 or above.

#### Award of NQF Qualifications

Credit gained for a standard may be used only once to meet the requirements of this qualification.

Unit standards and achievement standards that are equivalent in outcome are mutually exclusive for the purpose of award. The table of mutually exclusive standards is provided in the Qualifications Authority *Rules and Procedures* publications available at [www.nzqa.govt.nz/ncea/](http://www.nzqa.govt.nz/ncea/).

Reviewed standards that continue to recognise the same overall outcome are registered as new versions and retain their identification number (Id). Any version of a standard with the same Id may be used to meet qualification requirements that list the Id and/or that specify the past or current classification of the standard.

## Detailed Qualification Requirements

### Elective

A minimum of 60 credits, of which 40 credits are at level 4 or above, is required from the following standards.

Field Computing and Information Technology  
 Subfield Computing  
 Domain Generic Computing

<b>Id</b>	<b>Title</b>	<b>Level</b>	<b>Credit</b>
2783	Demonstrate knowledge of the components of personal computer systems	3	3
2785	Create a computer spreadsheet to provide a solution for organisation use	3	5
2787	Produce a computer flatfile database to provide solutions for organisation use	3	5
5947	Use computer technology to solve a specified problem	3	3
5952	Demonstrate an understanding of information systems analysis	4	3

Field Engineering and Technology  
 Subfield Design  
 Domain Design – Computer Graphics

<b>Id</b>	<b>Title</b>	<b>Level</b>	<b>Credit</b>
7481	Produce design ideas and images using computer graphics programs	2	3
19355	Produce scale production drawings using computer aided draughting (CAD) programs	3	8

Domain Design – Graphic Communication

<b>Id</b>	<b>Title</b>	<b>Level</b>	<b>Credit</b>
7484	Produce and deliver a multi-media presentation	4	5
7507	Use freehand sketching techniques to show design development	2	4
7508	Produce illustration and advertising graphics	2	4
7509	Produce circuits and/or systems graphics	2	4
7512	Produce production drawings to meet final design requirements	2	3
7513	Produce architectural and environmental drawings for presentation	3	5
7514	Produce package design and promotional graphics	3	5
7515	Produce engineering and product design drawings	3	5
7516	Produce rendered design graphics for presentation	3	5
7517	Produce architectural, structural, and interior design drawings	4	6
7518	Produce promotional and marketing graphics	4	6

<b>Id</b>	<b>Title</b>	<b>Level</b>	<b>Credit</b>
7519	Produce engineering, technological, and systems drawings for graphic communication	4	6
7520	Develop a graphic image to produce a product or service	4	5
7521	Produce 2D or 3D models for design and presentation	3	4
18995	Produce axonometric drawings	2	3
18996	Produce perspective and instrumental drawings	2	3

## Domain Generic Design

<b>Id</b>	<b>Title</b>	<b>Level</b>	<b>Credit</b>
7489	Identify design problems and carry out investigation	2	4
7490	Apply visual design elements to solve design problems	2	4
7491	Develop and refine design solutions	2	3
7492	Present design work	2	3
7493	Develop a design specification, and produce and implement an investigation plan	3	4
7494	Investigate and apply design principles and elements	3	4
7495	Apply design development and evaluation techniques	3	4
7496	Prepare, plan, and present design project work	3	4
7497	Write a design brief and specifications	4	4

Subfield Technology  
Domain Materials Technology

<b>Id</b>	<b>Title</b>	<b>Level</b>	<b>Credit</b>
7525	Select materials and establish processes for a manufacturing task	2	4
7526	Use, and care for, portable machine tools in materials technology	2	4
7527	Apply fabrication, assembly, and finishing methods in materials technology	2	4
7528	Work to design tolerances using marking out and measuring tools safely in materials technology	2	4
7529	Test and select materials for a design task	3	5
7530	Use, and care for, fixed machine tools in materials technology	3	5
7531	Select, apply, and test joining processes for materials technology	3	5
7533	Process materials for alternative or new uses	4	6
7534	Produce product components using computer-aided machining (CAM) in materials technology	3	6

## Domain Process Technology

<b>Id</b>	<b>Title</b>	<b>Level</b>	<b>Credit</b>
7532	Design, set up, and complete a short run production project in process technology	3	5
7537	Use information technology to obtain and present information for a project in process technology	2	3
7538	Develop, and apply time management and project organisation to, a design brief in process technology	2	3
7539	Produce project presentation using computers and reprographics in process technology	2	3
7540	Identify and obtain materials for manufacturing, and develop a sequence for manufacturing	2	3
7541	Research design problems and present conclusions in process technology	3	4
7542	Create a manufacturing system for short run production in process technology	3	4
7544	Apply project management planning practices in process technology	4	5

## Domain Systems Technology

<b>Id</b>	<b>Title</b>	<b>Level</b>	<b>Credit</b>
7549	Use rotary, reciprocating, and oscillating motion to solve mechanical problems in systems technology	3	5
7551	Modify an existing system of control and investigate its market potential for systems technology	4	6
7552	Create, and investigate market potential of, an electronic product for systems technology	4	6

Field Humanities

Subfield Communication Skills

Domain Interpersonal Communications

<b>Id</b>	<b>Title</b>	<b>Level</b>	<b>Credit</b>
1307	Present ideas and information orally to a specified audience in a predictable situation	3	3
1311	Present and defend an argument orally	4	4
1312	Give oral instructions in the workplace	3	3
9692	Present information orally to an audience	5	2
9694	Analyse and apply principles of communication process theory	3	4
9696	Apply problem solving strategies	4	4
11097	Listen to gain information in an interactive situation	3	3

## Domain Reading

<b>Id</b>	<b>Title</b>	<b>Level</b>	<b>Credit</b>
1272	Read efficiently to gain maximum information in time spent	3	2
2990	Read texts to research information	3	4

## Domain Writing

<b>Id</b>	<b>Title</b>	<b>Level</b>	<b>Credit</b>
1279	Write in plain English	3	2
3488	Write business letters and memoranda	2	6
3491	Write a report	3	4
9685	Write an analytical report	5	4
9701	Write proposals	4	3
11095	Write business correspondence to convey complex ideas and information	4	3

Field Sciences  
Subfield Mathematics  
Domain Algebra

<b>Id</b>	<b>Title</b>	<b>Level</b>	<b>Credit</b>
5253	Sketch and describe graphs	2	3
5256	Use sequences and series to solve problems in real and simulated situations	3	4
5262	Use linear systems to solve problems	3	2
5264	Use numerical methods to solve problems	3	3

## Domain Calculus

<b>Id</b>	<b>Title</b>	<b>Level</b>	<b>Credit</b>
5244	Demonstrate calculus skills	2	2
5260	Find and use derivatives to solve problems involving rate of change	2	2
5261	Find and use integrals to solve problems	2	2

Subfield Science  
Domain Physics

<b>Id</b>	<b>Title</b>	<b>Level</b>	<b>Credit</b>
6388	Apply formulae, graphical, vectorial and phasor methods to find unknowns for a physical system	3	3
6391	Demonstrate knowledge of, and determine unknowns for, wave systems	3	4
6394	Carry out a practical investigation of a physics-based application with guidance	3	3
6397	Demonstrate knowledge of circular, rotational, and simple harmonic motion	3	6

## Domain Science – Core

<b>Id</b>	<b>Title</b>	<b>Level</b>	<b>Credit</b>
9183	Demonstrate knowledge of units and notation in science	3	3

## Transition Arrangements

### Version 2

Version 2 was issued to take account of *Design*, *Mathematics*, and *Computing* unit standard reviews. Responsibility for the qualification has been transferred from the Design and Construction Consultants Industry Training Organisation to InfraTrain New Zealand.

Changes to structure and content

- *Design* unit standards 7482 and 7483 replaced by unit standard 19355
- *Design* unit standard 7511 replaced by unit standards 18995 and 18996
- Expired *Design* unit standard 7510 removed from qualification
- Level of *Mathematics* unit standards 5260 and 5261 decreased from 3 to 2
- Titles of *Computing* unit standards updated.

People currently working towards version 1 of this qualification may either complete the requirements for that version or transfer their results to this version of the qualification. The last date for people to complete version 1 is 31 December 2006.

For detailed information see [Review Summaries](#) on the Qualifications Authority website.

This qualification contains standards that replace earlier standards. For the purposes of this qualification people who have gained credit for the expiring standards are exempt from the requirement to gain credit for the replacement standards.

Expiring Standards	Replacement Standards
7482 and 7483	19355
7511	18995 and 18996

### NQF Registration Information

Process	Version	Date	Last Date for Award
Registration	1	October 1999	31 December 2006
Revision	2	July 2004	N/A

### Standard Setting Body

InfraTrain New Zealand  
PO Box 2759  
WELLINGTON

Telephone 04 499 9144  
Email [askus@infratrain.co.nz](mailto:askus@infratrain.co.nz)

Any person or organisation may contribute to the review of this qualification by sending feedback to the standard setting body at the above address.

The review of this qualification is planned to take place in 2009.

## Other standard setting bodies whose standards are included in the qualification

The involvement of other standard setting bodies depends on the electives undertaken, and can be found on the unit standards concerned.

## Certification

The certificate will display the logos of the Qualifications Authority and InfraTrain New Zealand.

## Classification

This qualification is classified according to the NQF classification system and the New Zealand Standard Classification of Education (NZSCED) system as specified below.

NQF Classification		NZSCED	
Code	Description	Code	Description
79	Engineering and Technology	030000	Engineering and Related Technologies/Engineering and Related Technologies not further defined

### Quality Management Systems

Providers and Industry Training Organisations must be accredited by a recognised Quality Assurance Body before they can register credits from assessment against standards. Accredited providers and Industry Training Organisations assessing against standards must engage with the moderation system that applies to those standards. Accreditation requirements and the moderation system are outlined in the associated Accreditation and Moderation Action Plan (AMAP) for each standard.