



Australian Government

ICTTEN812 Evaluate and apply digital signal processing to communications system

Release: 1

ICTTEN812 Evaluate and apply digital signal processing to communications system

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 2.0.

Application

This unit describes the skills and knowledge required to analyse, apply and simulate operation of digital signal processing (DSP) to signals in a telecommunications system.

It applies to individuals with excellent information technology (IT) and design skills working as field officers. They develop solutions in modern applications, such as internet protocol TV (IPTV), digital TV, fast broadband and internet applications.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Telecommunications – Telecommunications Networks Engineering

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
1 Apply DSP design criteria to telecommunications system	1.1 Review DSP criteria applied to signal processing 1.2 Perform frequency domain analysis on telecommunications signals 1.3 Apply digital processing techniques to DSP baseband communications signals used in digital systems 1.4 Generate output of a comb filter in digital filtering application using convolution theorem and autocorrelation
2 Determine linear time invariant (LTI) system	2.1 Simulate telecommunication entities using simulation software

ELEMENT	PERFORMANCE CRITERIA
properties	functions 2.2 Perform calculations to find numerical approximations of the continuous-time convolution process 2.3 Simulate echo cancellation by applying simulation software using adaptive DSP algorithms and an inverse filtering method
3 Analyse digital telecommunication signals processing	3.1 Analyse the result of digitally passing a signal through a first-order recursive discrete-time filter 3.2 Determine frequency response of a simple continuous-time system using Fourier transform 3.3 Analyse amplitude modulated signals using Fourier transform
4 Analyse time and frequency forms of signals by applying simulation of signal processing	4.1 Program a simulated software application to represent a comb filter with a signal applied from a telecommunications system 4.2 Produce a report analysing simulated output results and relevance of a DSP filter to a telecommunications system

Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1	Researches, evaluates and interprets complex technical documentation
Writing	4.2	Prepares clear and concise workplace documentation including reports that incorporate technical language to communicate complex information clearly and effectively
Numeracy	1.2, 1.4, 2.2, 2.3, 3.1-3.3	- Performs a range of complex, algorithmic calculations and analyses - Analyses and synthesises highly embedded mathematical information in a broad range of tasks and texts
Get the work done	1.1-1.4, 2.1, 2.3, 3.1-3.3, 4.1	- Uses a mix of intuitive and formal processes to identify key information and issues, evaluate alternative strategies, anticipate consequences and consider implementation issues and contingencies - Takes responsibility for high-impact decisions in

		complex situations involving many variables and constraints • Uses advanced features and functions of digital tools to complete work tasks
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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalenc e status
ICTTEN812 Evaluate and apply digital signal processing to communications system	ICTTEN8196A Evaluate and apply digital signal processing to communications system	Updated to meet Standards for Training Packages.	Equivalent unit

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=a53af4e4-b400-484e-b778-71c9e9d6aff2>

Assessment Requirements for ICTTEN812 Evaluate and apply digital signal processing to communications system

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Performance Evidence

Evidence of ability to:

- apply digital signal processing (DSP) criteria to a telecommunications system
- evaluate linear time invariant (LTI) system properties
- analyse digital and amplitude modulated signals using DSP methods and principles
- demonstrate an awareness of radio frequency issues relevant to DSP processes
- report on finding of analysis and use of DSP in a telecommunications system.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- summarise digital communications systems
- explain Fourier transforms
- explain linear time invariant (LTI)
- explain various modulation methods, amplitude (AM), frequency (FM), phase (PM) and digital formats
- explain organisational policy and procedures for digital signal processing
- outline common non-compliance issues and responses.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances should be typical of those experienced in the telecommunications networks engineering field of work and include access to:

- a telecommunications operations site

- digital communication systems
- simulation software
- telecommunications test equipment currently used in industry.

Assessors of this unit must satisfy the requirements for assessors in applicable vocational education and training legislation, frameworks and/or standards.

Links

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