

**1. Module details****Module name****New TV Technologies****Module duration**

It is expected that students with the appropriate entry knowledge and skills will successfully complete this module in 36 - 40 hours.

**Module code**

NUE 803

**Discipline code**

0703230

**2. Module purpose**

This module aims to provide the student with knowledge and skills in the area of new technologies as used in modern television receivers.

**3. Prerequisites**

NUE101 Introduction to Television.  
NUE105 Display Devices.

**4. Relationship to competency standards**

This module provides some of the knowledge and skills underpinning competence in the following standards: Metals and Engineering Industry National Competency Standards, Units 18.45A, 18.56A, 18.65A. National Electrotechnology Industry Standards, Units NES205, NES302, NES303, NES305, NES306, NES402, NES403, NES406, NES407.

**5. Content****Special effects in digital TV**

Block diagram

Integrated circuits

On screen displays (OSD) techniques

Picture in picture (PIP) techniques

Freeze mode (digital storage)

Previewing real time pictures while in freeze mode

Flicker reduction in interlaced scanning and apparent increase in resolution

Anti-ghosting, noise reduction and echo cancelling techniques

Conversion between PAL, NTSC and SECAM

High quality video and audio inputs

**New display technologies**

Special tube / projector construction including liquid cooling techniques

Liquid crystal projector techniques

Large flat screen tube techniques including foil type shadow mask

Digital wide screen tube techniques including foil type shadow mask

Digital and wide screen technology as applied to HDTV

Wide screen format (16 : 9 aspect ratio)

Grey scale magnification

Scan velocity modulation

Astigmatic focus  
Other display types

**Home theatre**

Combining digital and wide screen technology with high quality audio systems  
Compression and expanding (compounding - Dolby etc)  
Sound processing techniques  
Surround sound techniques  
Interfacing wide screen technology with audio and video optical disks

**Digital signal broadcasting**

Principles of operation  
Block diagram of transmissions process  
Modulation techniques  
Relevant standards  
Spectrum usage  
Block diagram of a digital TV receiver

**6. Assessment strategy**

**Assessment methods**

Assessment should be holistic in nature and requires the demonstration of the knowledge and skills identified in the module content. To be successful in this module the student should show evidence of achievement of the module purpose. A suitable strategy should include a written examination, written and practical assignments.

**Conditions of assessment**

Normally learning and assessment will take place in a classroom / laboratory environment.

**7. Learning outcome details****Learning outcome 1****Draw the block diagram and describe the operation of the major digital LSI chips in a modern colour TV.****Assessment criteria**

- 1.1 Describe the operation of various digital and/or microprocessor controlled circuits.
- 1.2 Describe the operation of the following facilities in current TV receivers:
  - channel selection and tuning
  - remote controls
  - picture storage
  - PIP
  - OSD
  - double scanning
  - picture enhancement and system conversion PAL / SECAM / NTSC.

**Learning outcome 2****Demonstrate knowledge of the most recent technological developments in television receivers and their applications.****Assessment criteria**

- 2.1 State the key features and principal of operation of Dolby surround sound.
- 2.2 State the key features and describe the principles of operation of HDTV, grey scale magnification, velocity scanning and astigmatic focus.
- 2.3 Describe the key features and principles of operation of wide screen formats, and flat screen tubes.
- 2.4 Describe the key features and principles of operation of liquid crystal projectors and high brightness projection tubes.

**Learning outcome 3****Draw the block diagram, and describe the operation of a typical home theatre system.****Assessment criteria**

- 3.1 Draw the block diagram and cabling arrangements for a typical home theatre.
- 3.2 State the factors to be considered after setting up a typical home theatre system.
- 3.3 State the factors to be considered when interfacing a VCR, video optical disk (DVD) and audio CD into a home theatre.

<b>Learning outcome 4</b>	<b>Describe digital video broadcast techniques.</b>
<b>Assessment criteria</b>	<p>4.1 Describe the modulation techniques employed to transmit a digitally encoded television signal.</p> <p>4.2 List relevant Australian standards.</p> <p>4.3 Draw the simplified block diagram of a digital video broadcast system from the camera to transmitter labelling all major functional blocks.</p> <p>4.4 Draw the block diagram of a digital receiver.</p> <p>4.5 Describe the purpose or function of each block in a digital video broadcast system.</p>
<b>8. Delivery of the module</b>	
<b>Delivery strategy</b>	<p>Delivery strategies must be suitable for learning both theoretical and practical aspects described in the module purpose. It is considered that the most effective way to achieve this is by the integration of theory and practice where students learn by experimentation and through research and laboratory reports. It is recommended that learning and assessment be facilitated in a holistic manner which may require learning outcome sequence other than that indicated in the module.</p>
<b>Resource requirements</b>	<p>This module is intended to provide an overview of new television technologies and will not enable students to service such receivers. Consequently it is not expected that TV receivers incorporating new technologies will be required for delivery of the module.</p> <p>Useful references include recent journal articles on new TV technologies, for example:</p> <p>LeJeune, <i>Introduction to Digital TV</i>, Television, Dec. 1997 Reed Business Information, PO Box 302, Haywards Heath, West Sussex RH16 3YY, UK</p> <p>M. Paul, <i>The Language of Digital TV</i>, Television, Feb 1998 Reed Business Information, PO Box 302, Haywards Heath, West Sussex RH16 3YY, UK</p> <p>Beroit H, <i>Digital TV</i> Arnold London 1997</p> <p>Laufer A, <i>Principles of Digital Audio &amp; Video</i> Artech House Boston 1997</p>

**Occupational health  
and safety requirements**

A safe and healthy environment will be provided for students and teachers as well as safety procedure with regard to learning / teaching activity.