1. Module details

Module name

Television Reception Systems

Module duration

It is expected that students with the appropriate entry knowledge and skills will successfully complete this module in 18 - 20 hours.

Module code

NUE414

Discipline code

0703230

2. Module purpose

The purpose of this module is to provide students with the knowledge and skills to enable them to select television antennas and associated components for a given application.

3. Prerequisites

Communication Fundamentals NE39

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

TV signal reception
Inadequate / optimum / excessive signal level
Multipath transmission
Interference

TV antennas
Types
TV antenna/satellite dish terminology
Multiple antennas

Transmission lines
Types
Characteristic impedance
Manufacturers data
Test equipment

Antenna distribution systems
Identical and adjacent channel interference
Antenna distribution components
Test equipment

Antenna fault-finding
Multiple outlet systems
Satellite systems

6. Assessment strategy

Assessment methods

Assessment should be progressive reflecting a holistic approach to ensure the module purpose is met. To assist in ensuring validity, reliability and fairness assessment instruments should include practical exercises, assignments and written tests consisting of a number of item types, such as multiple choice, short answer and problem solving.

Conditions of assessment

Normally learning and assessment will take place in a formal environment learning that is conducive to learning.

7. Learning outcome details

Learning outcome 1

Describe the common difficulties associated with television reception.

Assessment criteria

1.1 Describe the characteristics of optimum TV reception.

1.2 Describe the visual and audible symptoms of a signal undergoing various types of interference

1.3 Identify the cause of various TV reception difficulties from visible symptoms.

1.4 Describe the common methods used to overcome reception difficulties due to insufficient & excessive signal levels.

Learning outcome 2

Describe the operating characteristics of common types of TV receiving antennas.

Assessment criteria

2.1 Describe the antenna terms gain, directivity, beam width, front to back ratio and bandwidth.

2.2 Identify a simple yagi, phased array, log-periodic and co-linear television antenna.

2.3 State why baluns are required with most antennas

2.4 Describe the principles of horizontal and vertical stacking of antennas and determine appropriate parameters.

2.5 Identify typical C and K band satellite dishes.

	2.6	Describe the satellite dish terms gain, beam width, feed, Low Noise Block (LNB), magnetic azimuth and elevation.
	2.7	Explain the meaning of single and dual polarity LNB's.
Learning outcome 3	Select an appropriate coaxial cable for a TV reception system.	
Assessment criteria	3.1	Describe the term transmission line impedance and state the standard impedance for TV antenna systems.
	3.2	Outline the effect(s) of mismatching.
	3.3	Interpret the characteristics of antenna and satellite dish cable from manufacturer's data sheets.
	3.4	Select the appropriate cable for a typical domestic TV antenna and a basic satellite TV reception system.
	3.5	Identify two types of plug and socket arrangements commonly used in television receiver antennae systems.
	3.6	Correctly fit Belling Lee and F connector type coaxial plugs to a length of coaxial cable.
	3.7	Use a field strength meter to measure signal attenuation between TV channels.
Learning outcome 4	Describe a multiple outlet TV aerial system.	
Assessment criteria	4.1	Draw a diagram of a UHF/VHF antenna distribution system with up to four outlets.
	4.2	State the signal problems associated with incorrect termination.
	4.3	State the need for amplification in an antenna system.
	4.4	Select distribution components from a manufacturer's catalogue for a four-outlet antenna distribution system.
Learning outcome 5	Carry out performance testing and fault-find a multiple outlet antenna system.	
Assessment criteria	5.1	Install and carry out performance testing of a multiple outlet antenna system and a basic satellite system.

5.2 Install and carry out fault finding within a terrestrial or extra terrestrial television reception system.

8. Delivery of the module

Delivery strategy

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 a learning outcome sequence other than that indicated in the module.

Resource requirements

Resources should be sufficient for students to carry out experiments on an individual basis. This will require a range of antennas, coaxial cable and test equipment, which will enable the learner to select television antennas and associated components for a given application.

Useful references include:

Ibrahim KF 1994, *Television Receivers*
Longman Essex, England
ISBN 0-582-086175

Liff A et al 1993, *Colour and Black and White Television*
Prentice Hall, Englewood Cliffs
ISBN 0-13-150012-0

Zarach et al 1985, *Television: Principles and Practice*
MacMillan, Hampshire

Trundle E 1996, *Newnes Guide to TV and Video Technology*
Butterworth-Weinermann Oxford
ISBN 07506 23748

Botto D 1992, *A Basic Guide to Colour TV and VCRs*
Electronics Australia, Federal Publishing, Alexandria

Hills Industries, *Antenna Installation Manual*
Hills Industries, Edwardstown, SA 5036
ISBN 007573413

ESI, *Antenna Standards,* ESIA
PO. Box 154, Carlingford , NSW 2118

	AS 3815-1998, A guide to coaxial cabling in single and multiple premises Standards Australia, Homebush AS 1367-1885, *Multiple outlet distribution systems – Sound and vision* Standards Australia, Homebush Humphris R, TV Antennas in Technician Electronics, RMIT Where this module is used in an approved Traineeship or Apprenticeship program learners should be advised to obtain, where available, respective EE-Oz Training Standards[1] ***User Guides*** (*these outline in detail what training and work performance the Learner is required to undertake for the program*).
Occupational health and safety requirements	A safe and healthy environment will be provided for students and teachers as well as safe procedures with regard to learning / teaching activities.

[1] EEQSBA – ElectroComms and EnergyUtilities Qualifications Standards Body of Australia Ltd trading as EE-Oz Training Standards (www.ee-oz.com.au)