



COLLEGE OF ENGINEERING, SCIENCE & TECHNOLOGY

SCHOOL OF ELECTRICAL & ELECTRONIC ENGINEERING

DEPARTMENT OF ELECTRONIC ENGINEERING

PROGRAMME DOCUMENT

CERTIFICATE IV IN BROADCAST ENGINEERING



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1. INTRODUCTION

1.1 PROGRAMME DETAILS

- a. TITLE: CERTIFICATE IN BROADCAST ENGINEERING
- b. AWARD: CERTIFICATE IV IN BROADCAST ENGINEERING
- c. Short form: C4EB

1.2 HISTORY and DEVELOPMENT (RATIONALE)

Introduction

- In the early 1990s the specialized broadcast training program that used to train and license all the broadcast technicians in the region was discontinued;
- As a result of that decision – now we have a big shortage of qualified, trained and skilled broadcast technicians in the region.
- Due to this skills shortage many radio stations in the region have been severely affected with increased ‘down time’ or ‘off air’ hours and even days that has serious consequences on the effectiveness and usefulness of this media, even though radio is still the most popular and efficient media of communication, despite the influx of new modes of communications technology for the dissemination of information to the public.

Industry Survey Report

- In a survey conducted by PACMAS in 2013 amongst the regional broadcasters confirmed that less than 10% of all the technicians working in the Broadcast industry have received relevant training or proper qualification to work as a broadcast technician.
- Proper maintenance and servicing of equipment have not been carried out that affected the quality of service offered by the stations and ultimately a decline in the standards.
- In the Industry Advisory Committee (IAC) and consultation meetings which were held in Suva and Noumea during the 3rd PINA conference (Feb 2014), the technical managers and engineers who attended unanimously agreed to request PACMAS and FNU to develop an accredited training program for the Broadcast Technicians in the region.

1.3. GRADUATE PROFILE

- In general, the graduate of the Certificate IV in Broadcast Engineering should possess the knowledge, skills and attributes and be able to perform the tasks and procedures, as specified for level three and four in *University Academic and Students Regulation of the Fiji National University*.
- **More specifically, the graduate should be able to**
 - 1.3.1** Apply a combination of highly developed technical skills and appropriate manual skills in the analysis and solution of technical problems in Broadcast Engineering.
 - 1.3.2** Apply skills in standard design, testing, commissioning, inspection, plant operation & maintenance, fabrication or field work in Broadcast Engineering.
 - 1.3.3** Utilize systematic and logical approaches to problem solving in Broadcast Engineering.
 - 1.3.4** Transfer and apply theoretical concepts and technical skills to a range of situations in Broadcast Engineering.
 - 1.3.5** Integrate the theoretical concepts and technical aspects of Broadcast Engineering.
 - 1.3.6** Make well informed judgments to supervising and managing technical work in Broadcast Engineering, after appropriate experience and further information.

1.4. PHILOSOPHY

The Certificate IV in Broadcast Engineering is an initial technical and vocational programme which is intended to prepare persons for employment in the Broadcast industry.

The three skilled groups, commonly identified in the modern engineering workforce, are listed below:

- **ENGINEERING TECHNOLOGIST**
- **TECHNICIAN**
- **TRADESPERSON**

The Certificate IV Broadcast Engineering is directed towards the *TRADESPERSON* (CRAFTSMAN) category in the above list.

In engineering general, a **TRADESPERSON** undertakes predominantly manual and physical work, with some cognitive skills commensurate with trade tasks. Work at this level is usually performed in accordance with well-established practices and procedures and known solutions are applied to predictable problems.

The nature of broadcast technology requires a relatively extensive 'theoretical base' and rapidly changing equipment introduces an element of unpredictability and the need for the tradesperson to be able to adapt to change.

The total development of a tradesperson requires both a component of formal education and an extensive component of practical on-the-job training in industry. A limited formal component of work experience is provided within the Certificate program; but this must be supplemented by enterprise specific experience, both during and after graduation.

Much of the relevant to the broadcast engineering trade is concerned with invisible phenomena and relies heavily on relatively abstract models for explaining the operation and performance of circuits, systems and equipment. Instrument readings, used to quantify these phenomena, have to be interpreted in the context of these models, which in turn can only have any practical significance when parametric values have been determined through measurement.

The content and delivery of the Certificate IV in Broadcast Engineering emphasizes the practical application of the conceptual components of broadcast technology and avoids an inappropriate level of abstraction.

The Certificate IV in Broadcast Engineering is also concerned with developing an integrated approach to 'theory' and 'practice' and to emphasize the interdependence of 'theoretical concepts' and practical skills, based on the use of instruments.

1.5. PROGRAMME AIMS and OBJECTIVES

The main purpose of this programme is to prepare students for employment in trade level engineering occupations, requiring expertise in Broadcast Engineering.

The general characteristics of the programme are as outlined in Part III paragraph 4.2 of *University Academic and Students Regulation of the Fiji National University* and, more specifically, the programme aims to provide a broad based, initial vocational programme for those performing trade level Broadcast engineering work in a range of Broadcast industries – Radio and TV.

In achieving this aim, the programme provides a set of units which will enable graduates to work as maintenance technician in a range of electrical and electronic industries, requiring broadcast expertise, such as those concerned with:

- a) the installation of broadcast & electronic equipment or devices.
- b) workshop practice and safety in industries
- c) broadcast system and technology
- d) Computer/Microprocessor interface and application software
- e) Control Systems and industrial electronics
- f) Power systems circuits' functionality, trouble shooting and diagnosis
- g) Installation and maintenance of broadcast/telecommunication and networking systems and technology
- i) Correction, installation and/or maintenance of broadcast equipment and devices.

On completion of this programme the student should

1.5.1 Have acquired a base of knowledge and manual skills which will

- a) facilitate the exercise of discretion and judgment in the selection and use of methods and equipment.
- b) provide a basis for further study
- c) be appropriate for trade level occupations

1.5.2 Have acquired and be able to apply systematic methods for the correction, installation and servicing of broadcasting equipment.

1.5.3 Demonstrate an integrated approach to the practical and theoretical aspects of trade level broadcast engineering work.

1.5.4 Have acquired and be able to apply skills in the use of instruments and measurement techniques to facilitate the installation and maintenance of equipment and the diagnosis of faults.

1.5.5 Have acquired and be able to apply skills in oral and written communication and in the retrieval and interpretation of information, with particular emphasis on:

- a) The use of libraries and other resource centers to obtain information
- b) The correct use and interpretation of broadcasting terminology
- c) The interpretation and preparation of broadcast engineering documents, drawings and diagrams.

1.5.6 have completed a component of formal work experience and have demonstrated an ability to transfer skills and knowledge to and from the workplace.

2. PROGRAMME STRUCTURE

2.1. AWARD OF CERTIFICATE

The **CERTIFICATE IV IN BROADCAST ENGINEERING** is a unit based programme, which is awarded at **level 4** and requires the attainment of a total of **181 credits**, which are to be obtained as follows:-

2.2. UNIT DETAILS

The units in the programme are listed below.

Period: Trimester - 1

Serial No.	Unit Code	Unit Title	Lecture	Tutorial	Pract/Laboratory	Total Contact Hrs. per Trimester [12weeks]	Self-Directed Learning Hrs.	Total Learning Hrs.	Credit Points [15hrs=one credit point]
1	MTH304	Mathematics for Trade	2	1	2	48	57	105	7
2	EEE302	Electrical Principles	2	1	2	60	45	105	7
3	EEE303	Electronics Workshop Practice I	2	1	2	60	45	105	7
4	EEE305	Electrical Measurement and Component	2	1	2	60	45	105	7
5	EEE414	Computer Systems & Application.	2	1	2	60	45	105	7
6	COM301	Technical Communication	2	1	2	36	39	75	5
Total Hours per Week			30			324	276	600	40

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Period: Trimester - 2

Serial No.	Unit Code	Unit Title	Lecture	Tutorial	Pract/Laboratory	Total Contact Hrs. per Trimester [12weeks]	Self-Directed Learning Hrs.	Total Learning Hrs.	Credit Points [15hrs=one credit point]
1	EEE412	Digital Electronics	2	1	2	60	45	105	7
2	EEE413	Analog Electronics	2	1	2	60	45	105	7
3	EEE415	Electronics Communication	2	1	2	60	45	105	7
4	EEE416	Electronic Workshop Practice II	1		4	60	75	135	9
5	ETH301	Fundamentals of Ethical Practices	2	1	2	36	39	75	5
6	OHS401	Occupational Health & Safety	2	1	2	36	39	75	5
Total Hours per Week			30			312	288	600	40

Period: Trimester - 3

Serial No.	Unit Code	Unit Title	Lecture	Tutorial	Pract/Laboratory	Total Contact Hrs. per Trimester [12weeks]	Self-Directed Learning Hrs.	Total Learning Hrs.	Credit Points [15hrs=one credit point]
1	EEB400	Broadcast Engineering Fundamentals	2	1	2	48	42	90	6
2	EEB401	Audio/Video Equipment & Systems	2	1	2	48	42	90	6
3	EEB402	Broadcast Studios & Master Control Rooms	2	1	2	48	42	90	6
4	EEB403	Broadcast Chain & Auxiliary Services	2	1	2	48	42	90	6
5	EEB404	Digital Broadcasting Systems & Networking	2	1	2	60	45	105	7
6	EEB301	First Aid & Tower Safety	2	1	2	48	27	75	3
7	EEB405	Transmitters, Antennas & Coupling Units;	2	1	2	60	45	105	7
Total Hours per Week			35			360	285	645	41

PRACTICUM **Note:** *Practicum can be taken in-between trimesters (sandwich mode) or after trimester 3 depending on whichever is preferable/or convenient.*

Serial NO.	Unit Code	Unit Title	Total Contact Hrs. per Trimester [12weeks]	Self-Directed Learning Hrs.	Total Learning Hrs.	Credit Points (CP) [1CP=30Hrs]
8	IAB401	Studios Operations and Maintenance	-	600	600	20
9	IAB402	Master Control / Studio Transmitter Links (STL)	-	600	600	20
10	IAB403	Transmission Station Operation and Maintenance	-	600	600	20
Total Hours per Week						

2.3. DELIVERY MODES

2.3.1 Normal Full Time Attendance

- For full time students, the normal pattern of attendance allows the programme to be completed over **THREE TRIMESTER**.
- Students are recommended to obtain work experience between trimesters; but may proceed directly to the next trimester.
- Sponsored students normally attend on a '*trimester release*' basis and obtain work experience between trimesters.

2.3.2 Options of Delivery For Current Industry Manpower Up-skilling

- This training program was developed primarily at the request of the Broadcasters in the region to address their severe skills shortage in the technical area which may also impact on their long term sustainability as an organisation.
- The School/College in consultations with the Broadcasters may offer this training program or certain units of the program, in various combinations and options, on-line, modular and face-to-face mode to address the need of the industry, as long as it does not compromise the learning and academic quality of the program and the burden of costs are not with the university (FNU).

- **PRACTICUM**

2.3.2 Alternative Mode

This programme can also be run in the evening classes for working people if sufficient numbers of students are enrolled. Other patterns of attendance are possible, subject to student demand, staff availability and compliance with the specified pre-requisites.

2.4.1 GENERAL GUIDELINES

The order of delivery is governed by the **TABLE OF PRE-REQUISITES** shown in Table attached here with.

TABLE OF PRE-REQUISITES

Unit No.	Unit Code	Name of the unit	Level	Pre-requisite	Class Room Contact Hours	Self-directed Learning Hours	CP
1	MTH304	Preliminary Mathematics I	3	Completed Form 6 Maths	48	64	7
2	EEE302	Electrical Principles	3	Completed form 6	60	50	7
3	EEE303	Electronics Workshop Practice 1	3	Completed form 6	60	50	7
4	EEE305	Electrical Measurement and Component	3	Completed form 6	60	50	7
5	EEE414	Computer Application & Systems	4	Completed form 6	60	50	7
6	COM301	Technical Communication	3	Completed form 6 English	36	24	5
7	EEE412	Digital Electronics	4	Completion of EEE302	60	50	7
8	EEE413	Analog Electronics	4	Completion of EEE304 & EEE305	60	50	7
9	EEE415	Electronic Communication	4	Completion of EEE302 & EEE304	60	50	7
10	EEE416	Electronic Workshop Practice 2	4	Completion of EEE303	60	75	9
11	ETH301	Fundamentals of Ethical Practices	3	None	36	24	5
12	OHS401	Occupational Health & Safety	4	None	36	24	5
13	EEB400	Broadcast Engineering Fundamentals	4	Completion of EEE415	48	42	6
14	EEB401	Audio/Video Equipment & Systems	4	Completion of EEE413 & EEE 415	48	42	6
15	EEB402	Broadcast Studios & Master Control Rooms	4	Completion of EEE 415 & EEE 413	48	42	6
16	EEB403	The Broadcast Chain & Auxiliary Services	4	Completion of EEE 415	48	42	6
17	EEB404	Digital Broadcasting Systems & Networking	4	Completion of EEE 412	60	45	7
18	EEB301	First Aid & Tower Safety	3	No specific pre-requisite	27	75	3
19	EEB405	Transmitters, Antennas & Coupling Units	4	Completion of EEE 412, EEE 413 & EEE415	45	105	7
PRACTICUM							
20	IAB401	Studios Operations and Maintenance	4	Completion of Stage-1 units		600	20
21	IAB402	Master Control / Studio Transmitter Links (STL)	4	Completion of Stage-1 units		600	20
22	IAB403	Transmission Station Operation and Maintenance	4	Completion of Stage-3 units		600	20
TOTAL CP							181

3. PROGRAMME REGULATIONS

3.1 ADMISSION REQUIREMENTS

MINIMUM entry requirements are:

3.1.1 Completion of form 6 (year 12) or equivalent.

OR

3.1.2 Completion of year 10 or form 4 level schooling with at least three (3) years of relevant industrial experience and on their basis of maturity and work experience are considered by their sponsor to be able to successfully complete the training.

3.2 CREDIT VALUE

The **CERTIFICATE IV IN BROADCAST ENGINEERING** is awarded at **level 4** and requires the attainment of a total of minimum of **181** credits.

3.3 PROGRAMME DURATION

The minimum duration of the programme is **2 years** (1 year classroom delivery and 12 months industrial experience) when delivered on a fulltime trimester basis and the maximum duration is four (4) years.

3.4 CROSS CREDITING

Credit Transfer and Recognition of Prior Learning Credits are governed by *The University Academic and Students Regulations of the Fiji National University* and by regulations and procedures established by the Board of Studies.

3.5 PROGRESSION REQUIREMENTS

In general, progression within the programme is governed by *The University Academic and Students Regulations of the Fiji National University* and by regulations and procedures established by the Board of Studies. In particular,

3.5.1 Progression must be consistent with specified pre-requisites.

3.5.2 The **INDUSTRIAL ATTACHMENT** report must provide evidence of work done with relevant tasks in the specified area at the appropriate level.

4. ORGANISATION OF CONTENT

4.1 PROGRAMME COMPONENTS

The programme comprises 19 compulsory FNU based units and 12 months of relevant industrial experience.

4.2 PURPOSE OF COMPONENTS

- The purpose is to fully complete 19 compulsory FNU based units and 12 months industrial experience before being eligible for the award of “**Certificate IV in Broadcast Engineering**”.

4.2.1 COMPULSORY UNITS

- All the units are compulsory for all students.

4.2.2 INDUSTRIAL ATTACHMENT - GENERAL REQUIREMENTS

- Industrial attachment requires a formal contract between student, employers and FNU; so that the attachment has stated learning outcomes related to the application of principles and skills in the workplace.
- The work attachments assessments require a written report, detailing all the work done and observed with evidence that the specified objectives have been satisfactorily achieved.
- Students on attachment must cover work in the specified areas of broadcasting: **(1) Studios / Maintenance; (2) Master Control / Studio Transmitter Links (STL); (3) Transmission.**
- In particular the work attachment report should demonstrate:
 - a) A clear understanding of the nature and dynamics of the workplace
 - b) A clear understanding of the relative roles of the different levels of technical personnel in a broadcast engineering environment.
 - c) An ability to perform broadcast engineering work at the appropriate level.

5. STUDENT ASSESSMENT

5.1 PURPOSES OF ASSESSMENT

- Although all student assessment is characterized by the evaluation of learning outcomes; this evaluation is used for a number of distinct purposes, which can be broadly classified in two ways.

5.1.1 Summative assessment

- Summative Assessment is used to identify those assessment events which affect the granting of credits for a unit.
- In summative assessment, the extent to which specified learning outcomes have been achieved is measured and the results of this measurement are compared with the criteria specified in the assessment policy for each unit.

5.1.2 Formative assessment

- Formative Assessment is used to aid decisions related to instructional processes. It facilitates effective teaching and learning, by providing feedback to lecturers and students about the extent to which learning outcomes are being achieved.
- It is not directed towards assessing a student's suitability for the award of credits.

5.3 METHODS OF ASSESSMENT

The following assessment methods will be used:-

5.3.1 ASSIGNMENTS

- The term, **assignment** is used in this context to refer to work which is done by students, individually or as a group, without the assistance of the tutor or lecturer, to assess whether the students have understood the subject that was taught in class.
- Assignments can be used to measure a wide range of outcomes and competencies and should be used as a form of learning rather than just an assessment for the students.

5.3.2 CLASS EXERCISES

- This term is used to describe assessed work which is done in normal class time under the control of and with the possible assistance of the lecturer.

5.3.3 CLASS TESTS

- These are supervised tests, which are conducted progressively throughout the period of instruction, in normal class time.
- They sample those outcomes which can be evaluated, validly and reliably, by a written test and each test is restricted to a specific range of topics.
- Collectively, *Class Tests* enable individuals to be evaluated, under 'exam' conditions with a broader sampling of outcomes than is possible in a *Final Examination*.

5.3.4 Final Examination

- When a final examination is specified, it will be of **two(2)** hours duration, with ten minutes reading time and held after classroom tuition for the unit is finished.
- Final examinations cover a sample of those outcomes which can be assessed by a written test.

5.3.4.1 Attendance

- Class attendance is an important criterion that reinforces self-discipline and good time management.
- A person who hopes to go out and work as a Broadcast technician must show consistency in attendance in all scheduled classes.
- The minimum requirement for scheduled class attendance is **75%** ; **and those with less than 75% attendance will not be allowed to complete the final assessment or examination** for that unit.

5.3.4.2 Course Work Assessment

- The coursework assessments for the units are specified in each Unit Descriptor.
- For the examinable units in the Stage 3 (Trimester 3) will have **60% course** work and **20% written examination and 20 % Practical tests** where the practical test is specified; **and failing either the coursework or practical test will mean failing the unit.**

5.3.5 LABORATORY ASSIGNMENT

- These assess outcomes which require the direct 'hands-on' use of laboratory based equipment (e.g. instruments, computers, equipment etc.).
- In many units, they will involve the use of instruments and measurement techniques to evaluate the performance of systems, circuits and components.
- *Laboratory Assignments* used for summative assessment are different from laboratory exercises which are used in the teaching and formative assessment of skills related to the use of equipment.
- Students will be given the opportunity to learn and practice skills before being assessed through *Laboratory Assignments*.

5.3.6 PRACTICAL TEST

- In some units, **PRACTICAL TESTS** are specified and, in these, **INDIVIDUAL** students must demonstrate their ability to successfully complete the assigned task in order to pass the test and the unit.
- **Practical Tests** are also specified for Drawing, Workshop & Computing units and, in these, students are required to use tools/equipment; so that 'practical' skills can be evaluated on an INDIVIDUAL basis and under test conditions; these may be graded accordingly.

5.3.7 PRACTICAL TESTS ON WORKING HIGH POWERED TRANSMITTERS

- A Broadcast Technician is often required to work on 'live' transmitters.
- The technician/student being tested must be made aware of the risks and the dangers involved in working on a 'live' transmitter.
- This is a very important part of training a broadcast technician, and they should be able to analyse the fault condition before attempting to make any repair or changes to rectify the fault.
- All practical work and tests to be done on a working transmitter must be done under close supervision of a qualified broadcast technician.

- **Note: Failing these practical tests will mean a repeat of the training on the operation and maintenance of transmitters.**

5.3.8 PROJECTS

- The term, **PROJECT**, is used in this context to describe an activity through which the student is expected to demonstrate independent learning and the ability to source information.

5.4 CRITERIA FOR ASSESSMENT

5.4.1 REQUIREMENTS FOR AWARD OF UNIT CREDITS

a) Total Marks

- For all units, a **TOTAL MARK** is obtained by combining the results derived from each of the **SUMMATIVE** assessment components, using the **WEIGHTING** specified in the unit syllabus document.
- Appropriate standardization procedures will be used in obtaining this **TOTAL**.

b) Minimum Requirements

- In **ALL UNITS** a **TOTAL** of **AT LEAST 50%** or unless specified, is required for a student to be considered for a **PASS**.
- In units with a **FINAL EXAMINATION**, a specified **MINIMUM** exam mark must also be obtained before a student can be considered for a **PASS**.
- In some units, a specified **MINIMUM** level must **ALSO** be obtained in **OTHER ASSESSMENT COMPONENTS**, before a student can be considered for a **PASS**.
- In such cases, the **TOTAL** and **EXAMINATION** marks, on their own, do not provide sufficient information, from which eligibility for a **PASS** can be determined.
- A **MINIMUM** level is set in those cases where the outcomes being evaluated have a critical influence on the predictive validity of the unit in relation to other units and overall program aims.
- For example, **MINIMUM** levels are set for **Practical Tests** to ensure that key 'practical' and independent learning skills are acquired, before progression is allowed.

c) Summary

For **ALL** units, eligibility for a **PASS** requires a **TOTAL** of **AT LEAST 50%** AND ALSO the attainment of **AT LEAST** the **MINIMUM** mark specified in the UD's assessment chart.

d) Recording of Assessment Outcomes

Assessment outcomes will be recorded in accordance with the *University Academic and Students Regulation of the Fiji National University*.

The results for most units will be graded according to the level of achievement, as specified in *University Academic and Students Regulation of the Fiji National University*.

SPECIAL CASES: Fail – exclude

The Exam Board may recommend to the Academic Board that a student be excluded from the programme at any time if it considers that the student can gain no further benefit by continuing at FNU despite remedial work and counseling.

5.4.3 RE-ASSESSMENT OF UNITS

a) Repeat of a Unit

Students are required to repeat a unit, if failure is based on a **TOTAL** mark of less than **50%**

This will normally require the completion of work specified for **ALL** assessment components.

However, in the case of a satisfactory result in a relatively 'stand-alone' assessment component (e.g. a project), the Examination Board may recommend that this assessment component does **NOT** have to be repeated.

b) Re-assessment in Individual Assessment Components

- If the **TOTAL** mark is at least equal to **50%** and a pass is not awarded because of failure to reach the **MINIMUM** level in any of the individual assessment components, the Examination Board may recommend that the student be given the opportunity to satisfy the requirements of this component; without the need to repeat the whole unit.
- This is particularly appropriate where assessment requirements can be satisfied by allowing a student to complete work which has already been commenced (e.g. **Projects**).
- Part V and Section 16.0 of the *University Academic and Students Regulation of the Fiji National University* covers Supplementary Assessment.

- Supplementary assessment may be offered when a student scores more than 45% and less than 50% in a course, or where a student receives a DNQ grade. Where students pass a supplementary assessment, the letter grade awarded is “C”, with associated credit points.
- Supplementary assessment may take the form of a special examination, an assignment, an oral examination, or any other appropriate assessment instrument within the particular discipline, on the provision that the supplementary assessment task(s) must be equivalent, though not necessarily identical, to the initial assessment task(s).

5.5 FAIRNESS, VALIDITY AND RELIABILITY

5.5.1.1 Validity refers to the accuracy of a specific prediction or interpretation which has been made from the results of an assessment event. That is, it is concerned with the extent to which a measurement of learning outcomes serves the purpose for which it is intended.

5.5.1.2 Content validity requires an assessment event to sample those learning outcomes, which are within the scope of the unit or section of the unit being assessed. The determination of content validity requires a thorough examination of the items being used and an evaluation of the extent to which these are consistent with the learning outcomes and performance criteria specified in the unit descriptors.

5.5.1.3 Predictive validity is concerned with determining the extent to which assessment event results accurately predict performance in a following unit and/or success of graduates in the workplace. The determination of predictive validity requires the correlation of results between dependent units and a review of graduate performance 'on-the-job'.

5.5.2 Reliability refers to the extent to which the results of an assessment event are consistent and the degree of confidence which can be placed in the results.

Reliability is **NECESSARY BUT NOT SUFFICIENT** condition for validity.

Reliability is essentially a statistical concept and can be expressed by means of a **Reliability Coefficient** or through the **Standard Error of Measurement**.

5.5.3 Fairness refers to a number of factors which influence the quality of assessment.

- Fairness requires that:-
 - a) Students be given appropriate time and circumstances to demonstrate the achievement of learning outcomes;
 - b) Questions avoid areas of the unit which have not been taught;
 - c) Questions have an appropriate level of difficulty and the precise wording of instructions and questions.

5.5.4 Fairness, validity and reliability will be promoted as follows:

- a) The Board of Studies will organize and monitor the progressive development of validated item banks and marking guides for class tests and final examinations.
- b) The Board of Studies will organize and monitor the progressive development of non-test items such as laboratory assignments and project specifications.
- c) All final examinations will be moderated, by both an internal or external moderator, who will check the suitability of the exam before it is printed and check that student's exam scripts are accurately and consistently marked.
- d) External Examiners and Moderators will be appointed in accordance with the requirements of Part V, section 5.0 and 6.0 respectively of *University Academic and Students Regulation of the Fiji National University*.
- e) The Academic Board will organize the analysis of items used in class tests and exams evaluate the results of this analysis and determine if items need to be changed.
- f) The Academic Board will facilitate the maintenance of assessment standards by monitoring and evaluating the performance of students in both test and non-test assessment events.

6. MONITORING, EVALUATION and REVIEW

6.1 ACADEMIC BOARD

- The membership and responsibilities of the Academic Board will be in accordance with Part-V, section 3.0 of *the University Academic and Students Regulation of the Fiji National University*.
- The Academic Board will meet at least once per Trimester

6.2 EXAMINATION BOARD

- The membership and responsibilities of the Examination Board will be in accordance with Part-V, section 4.0 of the *University Academic and Students Regulation of the Fiji National University*. The Examination Board of will meet at least once per Trimester

6.3 MONITORING

- Programme review and monitoring will be undertaken in accordance with Part-V, section 2.0 of *The University Academic and Students Regulation of the Fiji National University*.

6.4 EXTERNAL MODERATION

6.4.1 External examiners and moderators will be appointed and perform duties in accordance with the Part-V, Section 5.0 and 6.0 of *The University Academic and Students Regulation of the Fiji National University*.

6.4.2 The Industry Advisory Committee will be appointed and perform duties in accordance with *The University Academic and Students Regulation of the Fiji National University*.

7. TEACHING and LEARNING METHODS

7.1 INTRODUCTION

- A variety of teaching methods will be used to facilitate the achievement of specified learning outcomes.
- Recently the Broadcast engineering is characterized by frequent changes in technology and students can be exposed to only a limited range of circuits, systems and equipment during the course of the Certificate IV programme.
- Teaching methods will therefore reflect the need to develop generic skills which can be applied to a range of situations and facilitate adaptation to changing methods and technologies.
- This will require the teaching of technical principles and analytical techniques at an appropriate but limited level of generality, which provides an appreciation of their universality, while ensuring that students develop skills in applying these to typical practical situations.
- Teaching methods will of necessity depend on the learning skills of students and the availability of resources.
- Although the Certificate IV program will encourage students to work independently, the current lack of self- directed learning skills in students entering the programme will require a structured didactic approach in the lower level units.
- The current lack of learning materials and basic educational technology still requires a large amount of classroom contact time to be used for the conveying of information.
- To facilitate effective learning, the following general principles will be progressively adopted:

7.1.1 The amount of classroom time devoted to the relaying of basic factual information will be minimized

7.1.2 The amount of classroom time devoted to information processing, the development of comprehension, the application of knowledge and problem solving will be increased

7.1.3 The availability of texts, references and other written resource material will be increased.

7.1.4 Overhead projectors and computers will be used to display circuit diagrams and other graphical information, copies of which will be given to students to enable them to concentrate on understanding rather than transcribing material.

7.1.5 Formative and summative assessment will concentrate on the testing of comprehension, application and problem solving and will **NOT** be based on rote learning and the memorization of verbal stereotypes.

7.1.6 Graded Projects will be used to facilitate the development of learning skills and the ability to source information.

7.1.7 Students will be expected to write and speak accurately, logically and precisely.

7.1.8 Computer based simulations and other analytical tools will be used to remove much of the computational burden, which previously imposed major constraints on the problem solving process and required significant amounts of energy to obtain solutions.

These simulations will enable students to concentrate on the often ignored aspects of problem formulation and interpretation and also facilitate student directed learning by enabling them to readily observe the effects of changing circuit/system parameters.

7.1.9 Time based delivery methods will be reduced; so that emphasis is placed equal learning outcomes rather than equal instruction times.

7.2 TEACHING STRATEGIES

The main specific teaching strategies will be:-

7.2.1 CLASSROOM BASED MODIFIED LECTURE

- This will be teacher managed and supported by written and visual learning resources. The amount of time used to relay basic factual information will be minimized.
- The teacher will concentrate on developing and evaluating understanding, application and analytical and problem solving skills.
- Students will be expected to be active participants; rather than passive listeners as is usual in a 'traditional' lecture through guided questions and interactive class exercises.
- Educational technology will be used to enable students to concentrate on critical outcomes and to minimize time consuming computational and transcription processes.

7.2.2 CLASSROOM BASED TUTORIAL

- This provides an opportunity for skills to be practiced and for difficulties to be discussed and resolved.

7.2.3 LABORATORY BASED SESSIONS

- These are used for teaching and assessing those learning outcomes which require the direct 'hands-on' use of laboratory based equipment. In many units, these outcomes are concerned with the use of instruments and measurement techniques to evaluate the performance of systems, circuits and components.
- In these sessions, the essential linkage between measurement, analysis and diagnosis will be emphasized and activities will be structured to ensure that no dichotomy develops between laboratory and theory based skills.
- Where appropriate, computer based simulations will be used to analyse circuits and systems; so as to provide a basis of comparison with measured results.

7.2.4 WORKSHOP BASED SESSIONS

- These are used for teaching and assessing those learning outcomes which require the direct 'hands-on' use of hand and machine tools and which are concerned with the development of psychomotor skills related to electrical installations and the construction and maintenance of electrical equipment.

7.2.5 FIELD VISIT

- This involves a visit to an off-campus site visit to investigate a broadcasting network – its structure, operation, installation and maintenance of equipment as relevant to the program.

8. UNIT DESCRIPTORS

[For stages 1 and 2 unit descriptors, please refer to Certificate IV in Electronic Engineering programme document]

8.1 Unit Descriptors for stage-3: specialized broadcast engineering units.

See:

Annex I: EEB400	Broadcast Engineering Fundamentals
Annex II: EEB401	Audio/Video Equipment & Systems
Annex III: EEB402	Broadcast Studios & Master Control Room
Annex IV: EEB403	The Broadcast Chain & Auxiliary Services
Annex V: EEB404	Digital Broadcasting Systems & Networking
Annex VI: EEB301	First Aid & Tower Safety
Annex V: EEB405	Transmitters, Antennas & Coupling Units

Annex I: EEB400

Broadcast Engineering Fundamentals

Annex III: EEB402

Broadcast Studios & Master Control Room

Annex IV: EEB403

The Broadcast Chain & Auxiliary Services

