FIJI NATIONAL UNIVERSITY

COLLEGE OF ENGINEERING, SCIENCE & TECHNOLOGY

SCHOOL OF ELECTRICAL & ELECTRONIC ENGINEERING

DEPARTMENT OF ELECTRONIC ENGINEERING

PROGRAMME DOCUMENT

TRADE DIPLOMA IN ELECTRONIC ENGINEERING (TELECOMMUNICATION & NETWORKING)

This programme document replaces all previous draft versions

Contents

1. INTRODUCTION

In order to cope with the challenge of increased engineering demand and in view of the growing awareness of society towards the environment, graduates with a sound scientific and technical knowledge who are also sensitive to the needs of the society and environment are the need of the hour. This program aims to produce graduates who will meet this need and will surpass the expectations of the industry, society and the country on this front. The program has been designed in such a way so as to allow the graduates develop a basic all-round knowledge in various engineering fields and at the same time enable them to gain a high level of professionalism in their chosen field of engineering with an insight into the engineering management principles. The program allows them to employ the principles of rational use of resources and inculcates in them, organizational discipline and basic supervisory skills which will prove beneficial to them and to the organization they would serve in, after finishing their education.

The **School of Electrical and Electronic Engineering** is committed to provide a learning environment that helps in developing graduates who are professionally sound, ethically upright and self-motivated. The school provides the correct mix of theoretical and practical knowledge as well as research and analytical opportunities so as to encourage independent thinking and critical reasoning among students.

1.1 PROGRAMME DETAILS

a. TITLE: **TRADE DIPLOMA IN ELECTRONIC ENGINEERING**.

b. AWARD: **TRADE DIPLOMA IN ELECTRONIC ENGINEERING (TELECOMMUNICATION AND NETWORKING).**

1.2 HISTORY and DEVELOPMENT (RATIONALE)

In 1992 a UK funded project commenced at the Fiji Institute of Technology (FIT) as part of programme of Technical Cooperation between the United Kingdom and Fiji.

The primary objective of the project was to improve the quantity and quality of the technical Graduates from the Engineering schools at the Fiji Institute of Technology. The project team was responsible to the Principal of FIT and comprised of engineering educators from the mechanical, building/civil and electrical engineering fields.

Their main tasks in the area of curriculum development were to:

- establish a unified course structure
- adopt a modular system in curriculum design
- establish a curriculum and examination resource bank.

Following the agreement between industry representatives and FIT at the end of 1994, Course duration and structures were finalized and curriculum documents prepared.

These were submitted to and endorsed by the Industry Advisory Committees on 21July, 1995.

1st Revision:

The ***revised*** document was presented and endorsed by the industry Advisory Committee on **14 December 2001**. Again, in accordance to the requirement of the Academic Statute the revised document was presented and endorsed by the Advisory Committee on **20th January 2005.**

2nd Revision:

In 2010, Fiji Institute of Technology and 5 other academic institution merged to establish Fiji National University. The programme was then change from Trade Certificate at level 3 to Certificate IV at level 4. The programme document and unit descriptor was then revised.

The curriculum documents, now being presented for consideration, have been prepared to comply with the requirements of ***The University Academic Student Regulation of the Fiji National University.***

3rd Revision:

In 2013, the College of Engineering, Science and Technology unanimously decided change the mode of delivery from Semester mode (14 Weeks) to Trimester mode (12 weeks). In October 2013, the Programme Document and Unit Descriptor started the revision to meet new standard as per SPRC & UASR guideline. Document submitted for IAC in December, 2013.

The revised curriculum documents, now being presented for consideration, have been prepared to comply with the requirements of ***The University Academic Student Regulation of the Fiji National University.***

1.3. GRADUATE PROFILE

In general, the graduate of the **Trade Diploma in Electronic Engineering (Telecommunication & Networking)** should possess the knowledge, skills and attributes necessary to perform the tasks and procedures, as specified for level fours(4) and five(5) in *University Academic and Students Regulation of the Fiji National University.*

Graduates shall be employable in technical areas where Electronic Engineering decision making is required at a middle management level. With few years of field experience these graduates can play leadership roles as a team leader or a line supervisor.

More specifically, the graduate should be able to:-

1.3.1 Apply a combination of highly developed technical skills and appropriate though limited manual skills in the analysis and solution of technical problems in a chosen area of specialization in Electronic Engineering.

1.3.2 Apply skills in standard design of electronic system, testing, commissioning, inspection, plant operation & maintenance, manufacturing or field work.

1.3.3 Employ systematic and logical approaches to problem solving.

1.3.4 Transfer and apply theoretical concepts and technical skills to a range of situations.

1.3.5 Integrate the theoretical concepts and technical aspects of Electronic/Electrical Engineering.

1.3.6 Make well informed judgments to supervising and managing technical work, after appropriate experience and further information.

A Trade Diploma graduate may have the technician's role in employment, can also become a Supervisor/Middle Manager or proceed to higher education studies to become a fully qualified professional engineer. Trade Diploma graduates from Electrical and Electronic Engineering also have an eligibility to directly enter into the second (2^{nd}) year of Bachelor in Engineering program offered by Fiji National University.

1.4. PHILOSOPHY

The Trade Diploma in Electronic Engineering (Telecommunication & Networking) is an initial vocational programme which is intended to prepare persons for employment in the upper middle level/paraprofessional engineering occupations, covering all areas of Electronic Engineering.

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

- **PROFESSIONAL ENGINEER**
- **ENGINEERING TECHNOLOGIST**
- **ENGINEERING ASSOCIATE**
- **TECHNICIAN**
- **TRADESPERSON**

The term upper middle level and para-professional are commonly used to refer to the **ENGINEERING ASSOCIATE** group in the above list. The term lower middle level is sometimes used to refer to the **TECHNICIAN** group.

The term para-professional is used over a wide range of occupations and in general refers to a person whose role is to support professional activities. In engineering, a para-professional engages in work which is predominantly conceptual and employs a combination of highly developed technical skills and appropriate, through limited manual skills.

Para-professional level skills are usually transferable and relevant to a broad range of industries, at least in the early career stages.

Work at this level is usually performed in accordance with well-established practices and precedents, which are commonly understood by those with expertise in the relevant field.

The total development of a para-professional 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 Trade Diploma programme; but this must be supplemented by enterprise specific experience, both during and after graduation.

The educational component of the Trade Diploma programme is directed towards the specific requirements of para-professional level engineering personnel and is, therefore, neither an extended trade level programme nor a diluted professional engineering program.

In particular, the content and the delivery of the Trade Diploma in Electronic Engineering (Telecommunication & Networking) emphasize the practical application of scientific and mathematical principles and avoid an inappropriate level of abstraction.

Electronic engineering is largely concerned with invisible phenomena and relies heavily on mathematically based models for circuit/system design and analysis. Instrument reading, used to quantify these phenomena, has 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 Trade Diploma is therefore 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 middle level/para-professional engineering occupations specializing in electronic technology. The programme is directed towards occupations with typical job titles such as technical officer, technician engineer, senior technician engineering associate etc.

The general characteristics of the programme are as outlined in **The University Academic & Student Regulation of the Fiji National University** and, more specifically, the programme aims to provide a broad based, initial vocational programme for the para-professional engineering technical workforce, specializing in electronic technology.

In achieving this aim, the programme incorporates:

a) the common core elements required by all such personnel

b) the range of units to enable specialization in aspects of electronic technology such as:

(i) Electronic communications technology and systems

(ii) Computer/microprocessor technology, systems and related software

(iv) Instrumentation technology and systems

(v) Control technology and systems

On completion of this programme the student should:-

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

a) facilitate adaptation to changes in methods and technology
b) provide a basis for further study and facilitates independent learning

c) be appropriate for middle management level occupations

1.5.2 Have acquired analytic and diagnostic skills and be able to apply this to:

a) diagnose and rectify faults

b) employ a logical and a systematic approach to problem solving

c) undertaken effective prototype testing, evaluation and minor design modifications

d) undertaken effective commissioning, calibration, maintenance and testing of equipment and systems.

1.5.3 Demonstrate an integrated approach to the practical and theoretical aspects of engineering

1.5.4 Have acquired and be able to apply skills in the use of instruments and measurement techniques to evaluate systems, circuits and components.

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 engineering terminology

c) the interpretation and preparation of engineering documents, drawings and diagrams

d) the conduct and reporting of engineering investigation

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 **TRADE DIPLOMA IN ELECTRONIC ENGINEERING (TELECOMMUNICATION AND NETWORKING)** is a unit based programme, which is awarded at **level 5** and requires the attainment of a total of **259** credits.

The program comprises of 26 x Level 4 units, distributed throughout Timester-1 to Trimester-3 and 19 x level 5 units in Trimester-4 and Trimester-5. The total no. of units a student has to complete in order to qualify for graduation is 45 units. Please refer to page 13 to 17 for details of each unit.

2.2. UNIT DETAILS

The units in the programme are listed below.

2.2.1 Trimester – 1 Units

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
1	MTH405	Engineering Mathematics I	4	2		72	78	150	10
2	MEC450	Engineering Graphics	2	0		24	36	60	4
3	CHM406/PHY416	Engineering Chemistry/Engineering Physics	4/4	2/2		72/72	48/48	120/120	8/8
4	CIN445/EEE460	Introduction to Computer Programming/Introduction to Electrical and Electronic Engineering	4/2	2/1		72/36	48/69	120/105	8/7
5	OHS445/ETH401	Occupational Health & Safety/Introduction to Ethics and Governance	3/2	1/2		48/48	27/48	75/135	5/9
6	COM401	Technical Communication II	2	4		69	81	150	10
7	MEC470	Engineering Graphic Laboratory			3	36	54	90	6
8	CHM470/PHY470	Engineering Chemistry Laboratory/Engineering Physics Laboratory			2/2	24/24	6/6	30/30	2/2
9	CIN470/EEE470	Introduction to Computer Programming Laboratory/Introduction to Electrical and Electronic Engineering Laboratory			2/2	24/24	6/21	30/45	2/3

Please do note that each student has to enrolled in only 9 units altogether per Trimester. The availability of the units is dependent on the availability of resources and materials in each school.

2.2.2 Trimester – 2 Units

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
1	MTH504	Engineering Mathematics II	4	2		72	78	150	10
2	MEC451	Engineering Mechanics	4	2		72	48	120	8
3	CHM406/PHY416	Engineering Chemistry/Engineering Physics	4/4	2/2		72/72	48/48	120/120	8/8
4	CIN445/EEE460	Introduction to Computer Programming/Introduction to Electrical and Electronic Engineering	4/2	2/1		72/36	48/69	120/105	8/7
5	OHS445/ETH401	Occupational Health & Safety/Introduction to Ethics and Governance	3/2	1/2		48/48	27/48	75/135	5/9
6	EWP452	Engineering Workshop Practice			3	36	39	75	5
7	MEC472	Engineering Mechanic Laboratory			2	24	6	30	2
8	CHM470/PHY470	Engineering Chemistry Laboratory/Engineering Physics Laboratory			2/2	24/24	6/6	30/30	2/2
9	CIN470/EEE470	Introduction to Computer Programming Laboratory/Introduction to Electrical and Electronic Engineering Laboratory			2/2	24/24	6/21	30/45	2/3

2.2.3 Trimester – 3 Units

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	EEE463	Workshop Practice for Electronic Technician	1		4	60	45	105	7
2	EEE475	Digital Electronic I	2	1		36	69	105	7
3	EEE476	Analog Electronic I	2	1		36	69	105	7
4	EEE466	Circuit Analysis	2	1		36	69	105	7
5	EEE468	Engineering Computing	2	1		36	54	90	6
6	EEE467	Electrical Principles	2	1		36	69	105	7
7	EEE471	Circuit Analysis Laboratory			3	36	9	45	3
8	EEE472	Electrical Principles Laboratory			3	36	9	45	3
9	EEE478	Analog and Digital Electronics Laboratory			3	36	9	45	3
			11	**5**	**13**	**348**	**402**	**750**	**50**
Total Hours per Week					**29**				

2.2.4 Trimester – 4 Units

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	EEE550	Project I - Electronics	1		4	60	60	120	8
2	EEE551	Digital Electronic II	2	1		36	69	105	7
3	EEE552	Analog Electronic II	2	1		36	69	105	7
4	EEE553	Electronic Communication System	2	1		36	69	105	7
5	EEE554	Computer System	2	1	2	60	30	90	6
6	EEE555	Computer Technology	2	1		36	54	90	6
7	EEE556	Analog and Digital Electronic Laboratory			3	36	9	45	3
8	EEE557	Electronic Communication System Laboratory			3	36	9	45	3
9	EEE558	Computer Technology Laboratory			3	36	9	45	3
			11	**5**	**15**	**372**	**378**	**750**	**50**
Total Hours per Week					**29**				

2.2.5 Trimester – 5 Units

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	EEE560	Project II - Electronics	1		4	60	60	120	8
2	EEE585	Engineering Management	3	1		48	42	90	6
3	EEE559	Electronic Communication System Technology	2	1		36	54	90	6
4	EEE561	Computer and Data Communication	2	1		36	54	90	6
5	ECI503	Introduction to Network	2		3	60	30	90	6
6	EEE562	Engineering Software	2		3	60	30	90	6
7	EEE563	Radar and Microwave	2	1	2	60	30	90	6
8	EEE564	Electronic Communication System Laboratory			3	36	9	45	3
9	EEE565	Computer and Data Laboratory			3	36	9	45	3
			13	**4**	**18**	**432**	**318**	**750**	**50**
Total Hours per Week					**35**				

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

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 **FIVE TRIMESTER**. Students are recommended to obtain work experience between trimesters; but may proceed directly to the next trimester, subject to the requirements specified for industrial attachment. Sponsored students normally attend on a *'trimester release'* basis and obtain work experience between trimesters.

The normal unit allocation for each block will be as follows:-

TRADE DIPLOMA IN ELECTRONIC ENGINEERING (TELECOMMUNICATION & NETWORKING)

TRIMESTER 1

NO.	UNIT CODE	UNIT NAME
1	MTH405	ENGINEERING MATHEMATICS I
2	MEC450	ENGINEERING GRAPHICS
3	CHM406 PHY416	ENGINEERING CHEMISTRY/ ENGINEERING PHYSICS
4	CIN445 EEE460	INTRODUCTION TO COMPUTER PROGRAMMING/ INTRODUCTION TO ELECTRICAL AND ELECTRONIC ENGINEERING
5	OHS445 ETH401	OCCUPATIONAL HEALTH & SAFETY INTRODUCTION TO ETHICS AND GOVERNANCE
6	COM401	TECHNICAL COMMUNICATION
7	MEC470	ENGINEERING GRAPHICS LABORATORY
8	CHM470 PHY470	ENGINEERING CHEMISTRY LABORATORY/ ENGINEERING PHYSICS
9	CIN470 EEE470	INTRODUCTION TO COMPUTER PROGRAMMING LABORATORY/ INTRODUCTION TO ELECTRICAL AND ELECTRONIC ENGINEERING LABORATORY

TRIMESTER 2

NO.	UNIT CODE	UNIT NAME
1	MTH504	ENGINEERING MATHEMATICS II
2	MEC451	ENGINEERING MECHANICS
3	EWP452	ENGINEERING WORKSHOP PRACTICE
4	PHY416 CHM406	ENGINEERING PHYSICS/ ENGINEERING CHEMISTRY
5	EEE460 CIN445	INTRODUCTION TO ELECTRICAL & ELECTRONIC ENGINEERING/ INTRODUCTION TO COMPUTER PROGRAMMING
6	ETH401 OHS402	INTRODUCTION TO ETHICS AND GOVERNANCE/ OCCUPATIONAL HEALTH AND SAFETY
7	MEC472	ENGINEERING MECHANICS LABORATORY
8	PHY470 CHM470	ENGINEERING PHYSICS LABORATORY/ ENGINEERING CHEMISTRY LABORATORY
9	EEE470 CIN470	INTRODUCTION TO ELECTRICAL & ELECTRONIC ENGINEERING LABORATORY/ INTRODUCTION TO COMPUTER PROGRAMMING LABORATORY

TRIMESTER 3

NO.	UNIT CODE	UNIT NAME
1	EEE463	WORKSHOP PRACTICE FOR ELECTRONIC TECHNICIAN
2	EEE475	DIGITAL ELECTRONICS I
3	EEE476	ANALOG ELECTRONICS I
4	EEE466	CIRCUIT ANALYSIS
5	EEE477	ENGINEERING COMPUTING
6	EEE467	ELECTRICAL PRINCIPLES
7	EEE471	CIRCUIT ANALYSIS LABORATORY
8	EEE472	ELECTRICAL PRINCIPLE LABORATORY
9	EEE478	ANALOG AND DIGITAL ELECTRONICS LABORATORY

TRIMESTER 4

NO.	UNIT CODE	UNIT NAME
1	EEE550	PROJECT I - ELECTRONICS
2	EEE551	DIGITAL ELECTRONICS II
3	EEE552	ANALOG ELECTRONICS II
4	EEE553	ELECTRONIC COMMUNICATION SYSTEM
5	EEE554	COMPUTER SYSTEM
6	EEE555	COMPUTER TECHNOLOGY
7	EEE556	ANALOG II AND DIGITAL II ELECTRONICS LABORATORY
8	EEE557	ELECTRONIC COMMUNICATION SYSTEM LABORATORY
9	EEE558	COMPUTER TECHNOLOGY LABORATORY

TRIMESTER 5

NO.	UNIT CODE	UNIT NAME
1	EEE560	PROJECT II - ELECTRONICS
2	EEE585	ENGINEERING MANAGEMENT
3	EEE559	ELECTRONIC COMMUNICATION SYSTEM TECHNOLOGY
4	EEE561	COMPUTER AND DATA COMMUNICATION
5	ECI503	INTRODUCTION TO NETWORK
6	EEE562	ENGINEERING SOFTWARE
7	EEE563	RADAR AND MICROWAVE
8	EEE564	ELECTRONIC COMMUNICATION SYSTEM TECHNOLOGY LABORATORY
9	EEE565	COMPUTER AND DATA LABORATORY

PRACTICUM – TRIMESTER BREAK

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 specified pre-requisites.

2.4 PRE-REQUISTE TABLE

2.4.1 GENERAL GUIDELINES

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

Unit No.	Unit Code	Name of the unit	Level	Pre-requisite	Class Room Contact Hours	Self-directed Learning Hours	CP
1	MTH405	ENGINEERING MATHEMATICS I	4	MER as per PROG DOC	72	78	10
2	MEC450	ENGINEERING GRAPHICS	4	MER as per PROG DOC	24	36	4
3	CHM406	ENGINEERING CHEMISTRY	4	MER as per PROG DOC	72	33	8
4	CIN445	INTRODUCTION TO COMPUTER PROGRAMMING	4	MER as per PROG DOC	72	48	8
5	OHS445	OCCUPATIONAL HEALTH AND SAFETY	4	MER as per PROG DOC	48	27	5
6	COM401	TECHNICAL COMMUNICATION II	4	MER as per PROG DOC	69	81	10
7	MEC470	ENGINEERING GRAPHICS LABORATORY	4	MER as per PROG DOC	24	6	2
8	CHM470	ENGINEERING CHEMISTRY LABORATORY	4	MER as per PROG DOC	24	6	2
9	CIN470	INTRODUTION TO COMPUTER PROGRAMMING LABORATORY	4	MER as per PROG DOC	24	6	2
10	MTH504	ENGINEERING MATHEMATICS II	5	Pass MTH405	72	78	10
11	MEC451	ENGINEERING MECHANICS	4	MER as per PROG DOC	72	48	8
12	EWP452	ENGINEERING WORKSHOP PRACTICE	4	MER as per PROG DOC	33	12	3
13	PHY416	ENGINEERING PHYSICS	4	MER as per PROG DOC	72	48	8
14	EEE460	INTRO. TO ELECTRICAL & ELECTRONIC ENGINEERING	4	MER as per PROG DOC	36	69	7
15	ETH401	INTRODUCTION TO ETHICS AND GOVERNANCE	4	MER as per PROG DOC	48	87	9
16	MEC472	ENGINEERING MECHANICS LABORATORY	4	MER as per PROG DOC	24	6	2
17	PHY470	ENGINEERING PHYSICS LABORATORY	4	MER as per PROG DOC	24	6	2
18	EEE470	INTRODUCTION TO ELECTRICAL & ELECTRONIC ENG. LABORATORY	4	MER as per PROG DOC	36	9	3
19	EEE463	WORKSHOP PRACTICE FOR ELECTRONIC TECHNICIANS	4	PASS EEE470	60	45	7
20	EEE475	DIGITAL ELECTRONICS I	4	PASS EEE460	36	69	7
21	EEE476	ANALOG ELECTRONIC I	4	PASS EEE460	36	69	7

22	EEE466	CIRCUIT ANALYSIS	4	PASS MTH504 & EEE460	36	69	7
23	EEE468	ENGINEERING COMPUTING	4	PASS CIN445	36	54	6
24	EEE467	ELECTRICAL PRINCIPLES	4	PASS EEE460	36	69	7
25	EEE471	CIRCUIT ANALYSIS LABORATORY	4	PASS EEE470	36	9	3
26	EEE472	ELECTRICAL PRINCIPLES LABORATORY	4	PASS EEE470	36	9	3
27	EEE478	ANALOG AND DIGITAL ELECTRONIC LABORATORY	4	PASS EEE470	36	9	3
28	EEE550	PROJECT I – ELECTRONICS	5	PASS EEE466 & EEE467	60	60	8
29	EEE551	DIGITAL ELECTRONICS II	5	PASS EEE475	36	69	7
30	EEE552	ANALOG ELECTRONICS II	5	PASS EEE476	36	69	7
31	EEE553	ELECTRONIC COMMUNICATION SYSTEM	5	PASS EEE475 & EEE476	36	69	7
32	EEE554	COMPUTER SYSTEM	5	PASS EEE468 & CIN445	60	30	6
33	EEE555	COMPUTER TECHNOLOGY	5	PASS EEE468 & CIN445	36	54	6
34	EEE556	ANALOG II & DIGITAL II ELECTRONICS LABORATORY	5	PASS EEE478	36	9	3
35	EEE557	ELECTRONIC COMMUNICATION SYSTEM I LABORATORY	5	PASS EEE478	36	9	3
36	EEE558	COMPUTER TECHNOLOGY LABORATORY	5	PASS EEE468	36	9	3
37	EEE560	PROJECT II – ELECTRONICS	5	PASS EEE550	60	60	8
38	EEE585	ENGINEERING MANAGEMENT	5	PASS COM401	48	32	6
39	EEE559	ELECTRONIC COMMUNICATION SYSTEM TECHNOLOGY	5	PASS EEE553	36	54	6
40	EEE561	COMPUTER AND DATA COMMUNICATION	5	PASS EEE555	60	30	6
41	ECI503	INTRODUCTION TO NETWORK	5	PASS EEE553	60	30	6
42	EEE562	ENGINEERING SOFTWARE	5	PASS EEE554	60	30	6
43	EEE563	RADAR AND MICROWAVE	5	PASS EEE553, EEE557	60	30	6
44	EEE564	ELECTRONIC COMMUNICATION SYSTEM TECHNOLOGY LABORATORY	5	PASS EEE557	36	9	3
45	EEE565	COMPUTER AND DATA LABORATORY	5	PASS EEE558	36	9	3
PRACTICUM							
TOTAL CP							259

Table 1.

3. PROGRAMME REGULATIONS

3.1 ADMISSION REQUIREMENTS

(a) Minimum entry requirement (MER) for this program shall be a pass in the Fiji School Leaving Certificate (12 years of education with continuous progression) or its equivalent with at least 50% marks in Mathematics, English, Physics and any one of the following subjects : Chemistry, Technical Drawing, Metal Technology or Computer Studies.

OR

(b) Holders of Certificate IV or equivalent in relevant discipline may also be admitted into the program.

OR

(c) Under exceptional circumstances mature applicants with relevant industrial experience may also be admitted.

3.2 CREDIT VALUE

The total credit value for the units in this program is 259 credits. The students should compulsorily acquire all the credits for qualifying this diploma programme. Exemption may be granted to students who have cross-credited the units of OHS and/or Ethics values and Governance.

3.3 PROGRAMME DURATION

The program can be completed in five trimesters plus six months industrial attachment. The industrial experience requirement can be waived for students with adequate industrial experience. The maximum duration of the program is four years for full time students and seven years for the part time students.

3.4 CROSS CREDITING

Cross crediting of units shall be done as per the relevant University Academic and Student Regulations (UASR).

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 tables in page 21 and 22.

3.5.2 Students may not proceed beyond level 4 units without the completion of the ***MID PROGRAMME INDUSTRIAL ATTACHMENT*** and a satisfactory 'Industrial Training Report'. Normally, this work experience will be obtained between trimesters. The report must demonstrate the completion of tasks at **level 5** or above.

3.5.3 Students must complete all LEVEL 5 units before commencing the ***FINAL INDUSTRIAL ATTACHMENT***. The report must provide evidence of the completion of tasks at **level 5**.

4. ORGANISATION OF CONTENT

4.1 PROGRAMME COMPONENTS

The programme comprises 45 compulsory FNU based units and 6 month industrial attachment.

4.2 PURPOSE OF COMPONENTS

4.2.1 COMPULSORY UNITS

These are the common core elements, which must be completed by all students, irrespective of the area of specialization.

4.2.2 INDUSTRIAL ATTACHMENT - GENERAL REQUIREMENTS

Industrial attachment requires 6 month duration for student, so that the attachment has stated learning outcomes related to the application of principles and skills to the workplace.

All attachments require a written report, which is to describe the work undertaken and provide evidence that specified objectives have been achieved.

In particular the reports should demonstrate the following:-

a) A clear understanding of the nature, structure and dynamics of the workplace

b) A clear understanding of the relative roles of the different levels of technical personnel in an engineering environment.

c) An ability to perform engineering work at the appropriate level.

4.2.3 MID PROGRAMME INDUSTRIAL ATTACHMENT

Students may proceed for industrial attachment beyond level 4 units without the completion of the program in level 4 units and the satisfactory completion of an 'Industrial Training Report'.

Normally, this work experience shall be obtained between trimesters.

The report must demonstrate the completion of tasks at **level 4** or above.

4.2.4 FINAL INDUSTRIAL ATTACHMENT

Students must complete at least all of the compulsory units before commencing the final industrial attachment of 6 month. The report must provide evidence of the completion of tasks at **level 5**.

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.

5.2 ASSESSMENT PHILOSOPHY

5.2.1 FORMATIVE ASSESSMENT

The planning and implementation of formative assessment is a major professional responsibility of the lecturer who must take into account his/her unique teaching style and the specific differences of each group of students.

For this reason formative assessment requirements are not prescribed in unit syllabus documents.

Formative assessment is not restricted to a quantitative measurement of learning outcomes and will generally include various forms of qualitative evaluation.

5.2.2 SUMMATIVE ASSESSMENT

In this programme, summative assessment is not restricted to testing at the end of the unit; but involves continuous assessment, which means that a representative sampling of student achievement takes place at regular intervals and in ways which are valid, reliable and fair.

Because of the need for consistency in the granting of credits, summative assessment requirements are specified in unit syllabus documents.

The diversity of learning outcomes in the programme requires a range of assessment instruments, the use of which is governed by the nature of the outcomes being measured.

5.3 METHODS OF ASSESSMENT

The following assessment methods will be used

5.3.1 ASSIGNMENTS

The term, ***ASSIGNMENT***, is used in this context refer to work which is done by students, outside of normal class time, and which will normally be presented on paper, in graphical and/or written form.

Assignments are used to measure a wide range of outcomes. However, they will concentrate on those tasks which cannot be assessed adequately within the constraints imposed by a supervised written test or exam.

These include detailed analysis and problem solving and those time consuming activities which are not feasible in the limited time available for a test.

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. In some units, class exercises will involve short tasks, which assess outcomes similar to those in 5.3.1 but, because of time limitation, coverage is less detailed and extensive than is possible with ***Assignments***.

In others, such as workshop and drawing units, tasks will be more extensive and this method of assessment is specified because of the need for access to facilities, which are not available to students outside of FNU.

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, validated and reliably, by a written test and each test is restricted to a specific range of topics.

Class Tests are different from those tests which may be used for formative purposes and will not be set until students have been given adequate time to develop the relevant competencies.

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 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.

Examination questions will be limited in type and extent to those which can be validly, reliably and fairly asked in the time available.

Because class attendance in most cases related to the achievement of learning outcomes, eligibility to sit for a final examination and final assessment of examinable and non-examinable units will be dependent on achievement of at least **75% or over in Attendance** and the **minimum Coursework of 50%.**

Because the various assessment instruments are restricted to the evaluation of the range outcomes for which they are suitable, eligibility to sit for the final examination may depend on a course work' mark derived from other assessment events.

5.3.5 LABORATORY ASSIGNMENTS

These assessment 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***.

Because they are time consuming and require the use of special equipment, laboratory assignments should not be used for outcomes which can be effectively measured in other ways.

5.3.6 PRACTICAL TESTS

In many cases, equipment limitations require ***Laboratory Assignments*** to be performed by groups of students. Therefore, in some units, ***PRACTICAL TESTS*** are specified and, in these, **INDIVIDUAL** students demonstrate the achievement of outcomes of the type covered by ***Laboratory Assignments***.

When equipment limitations and/or the effective supervision of such tests require a low student/lecturer ratio, coverage will be restricted and will concentrate on key skills, e.g. the use of instruments and basic testing methods.

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.

In such units, these tests may also include the evaluation of outcomes of the type covered by ***Class Tests.***

5.3.7 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.

Project requirements vary considerably in breadth and depth and are governed by the level of the unit in which they are used. These requirements range from some form of investigation with results presented in a written form to more extensive tasks, such as the construction and testing of a circuit or system, with a report of circuit/system performance. In higher level units, ***Projects*** involve the integration of a number of topic areas and require the student to demonstrate the ability to plan and prioritize. In many cases, specific project requirements will be determined by negotiation between students and staff.

5.4 CRITERIA FOR ASSESSMENT

5.4.1 REQUIREMENTS FOR AWARD OF UNIT CREDITS

a) Total Mark

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 assessment the table in each unit descriptor.

Appropriate standardization procedures will be used in obtaining this **TOTAL**.

b) Minimum Requirements

In **ALL UNITS** a **TOTAL** of **AT LEAST 50%** 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*** & ***Projects*** to ensure that key 'practical' and independent learning skills are acquired, before progression is allowed to other units, which require these skills.

MINIMUM requirements are specified in the unit syllabus.

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 for any other assessment components.

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, as indicated by the grade according to the level of achievement, as specified in the ***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.

5.4.2 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% but is 44%** or higher. 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***).

The ***University Academic and Students Regulation of the Fiji National University*** covers the particular case where the **MINIMUM** level for a final examination has not been reached.

If a re-sit is recommended, it will not be a special exam; but will be provided during the next scheduled exam period for the particular unit. Students will be given appropriate *remedial tuition* before being allowed to re-sit an examination or re-assessed in test based assessment components.

5.4.3 ASSESSMENT PROCEDURES AND REGULATIONS

All assessment will be performed and results processed in accordance with the relevant sections of the ***University Academic and Students Regulation of the Fiji National University*** and with **other** procedures and regulations specified by relevant bodies, such as the Senate.

5.5 FAIRNESS, VALIDITY AND RELIABILITY

5.5.1

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.

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.

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 students be given appropriate time and circumstances to demonstrate the achievement of learning outcomes.

Fairness requires that test questions avoid areas of the unit which have not been taught. Fairness requires that 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 can be moderated, by either an internal or external moderator depend on the suitable person with qualification and experience, who will check the suitability of the exam paper before it is printed and also 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 sections 5 and 6 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 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 section 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 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 ***University Academic and Students Regulation of the Fiji National University.***

6.4.2 Final stage papers may be externally moderated by experts in appropriate fields from time to time in accordance with the ***University Academic and Students Regulation of the Fiji National University*** guidelines.

6.4.3 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. Trade Diploma in Electronic Engineering (Telecommunication & Networking) 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 trade diploma 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 Trade Diploma program will encourage students to work as a team and also 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.

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. This will be achieved 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 electronic installations and the construction and maintenance of electronic based application equipment.

7.2.5 FIELD VISIT

This involves a one (1) day or more, visit to various industries to investigate the operations of system and equipment related to particular units or programme.