



**COLLEGE OF ENGINEERING, SCIENCE  
& TECHNOLOGY**

**SCHOOL OF AUTOMOBILE ENGINEERING & ROAD  
TRANSPORT**

**Trade Diploma in Automotive Engineering**

**Programme Document**

**&**

**Unit Descriptions**

**2014**

**COLLEGE OF ENGINEERING, SCIENCE  
& TECHNOLOGY**

**FACULTY OF TRANSPORT**

**SCHOOL OF AUTOMOBILE ENGINEERING & ROAD TRANSPORT**

**DEPARTMENT OF AUTOMOTIVE ENGINEERING**

**Trade Diploma in Automotive Engineering**

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**College of Engineering, Science and Technology**  
**School of Automobile Engineering & Road Transport**  
**Department of Automotive Engineering**  
**Trade Diploma in Automotive Engineering**

**1.0 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 Automobile Engineering and Road Transport 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 Rationale**

The Trade Diploma in Automotive Engineering is a qualification designed to bridge the gap between a professional engineer and an engineering tradesman. A graduate technician will be able to apply knowledge and advanced technical skills in his/her area of expertise and generate a range of solutions to the technical problems faced in the field. The graduate should be able to take some supervisory responsibility of tradesmen and lead his team in performance of various technical tasks, generating reports and communiqués as required in the industry.

The students of these programmes are also expected to gain sufficient working knowledge of mathematics, physics, chemistry, graphic expression, computer programming and management, which would prepare them for the specific jobs in engineering.

## **1.2 Graduates profile:**

Graduates shall be employable in technical areas where automotive 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.

The successful graduate shall be able to contribute within a wide range of automotive and mechanical engineering areas such as, material, design, manufacturing and management. The duties and responsibilities would include:

- Analyzing and converting complex situations into simpler routines and procedures.
- Making useful contribution on selection of technical solutions, comparison and decision making.
- Advising on technical standards and quality control requirements.
- Performing under minimal supervision and taking responsibility for other team members
- Maintaining plant, systems and equipment to perform reliably during its expected working life.
- Undertaking technical diagnostic work in an objective and responsible manner and write detailed reports on its findings.

A Diploma graduate may have the technician's role in employment, become a supervisor/middle manager or proceed to higher education studies to become a fully qualified professional

engineer. Diploma graduates from Automotive Engineering also have an eligibility to directly enter into the second year of Bachelor in Engineering program offered by Fiji National University.

### **1.3 Program Philosophy**

The philosophy of the program is to educate the students in the field of automotive engineering making them to apply the acquired skills and knowledge in the industrial environment such as power, materials, design, manufacturing, maintenance and engineering management sector, thus helping the nation in its technical and economic development.

### **1.4 Aims and Objectives:**

The aims and objectives of the program are to:

- Provide industry with adequate number of capable and trained manpower who have acquired a sound knowledge and understanding of the principles and processes of automotive engineering.
- Provide good practical input with theoretical knowledge for technological advancement of the industry/society.
- Provide a basis for further studies in the chosen field of engineering specialization.
- Develop the knowledge of the students to enable them to make a positive contribution to the standards of quality in their field of employment.
- Promote good communication skills for generating reports and communiqués.
- Develop high ethical standards, values, decision making and to make graduates be a responsible citizen.
- Provide support and cooperate with industry and relevant training agencies in the development of competency to meet their employment needs.

## **2.0 PROGRAMME REGULATIONS**

### **2.1 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 in Automotive Engineering or its equivalent in a relevant discipline may also be admitted into the program.

OR

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

### **2.2 Credit Value of Programme**

The total credit value for the units in this program is 262 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.

### **2.3 Duration of Programme**

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.

### **2.4 Cross Crediting**

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

## **2.5 Award of Diploma**

The general requirements for award of the qualification are laid down in the latest issue of the University Academic and Student Regulations.



### **3.0 PROGRAMME STRUCTURE**

#### **3.1 General**

The programme is offered in five trimesters in accordance with the programme structure given in Table 1. The student will be expected to undergo an industrial attachment of six months duration in a relevant industry. The student is also expected to maintain a Work Experience Record Book (WERB) issued by the respective school during the course of the industrial attachment and submit the same to the school 4 weeks before the last date of application for graduation.

#### **3.2 Compulsory Components**

All the units are compulsory.

#### **3.3 Optional Components**

This program is meant for developing graduates with professional skills and most of the units are focused for developing such skills. Therefore in this program optional units are not being offered.

#### **3.4 Special Requirements**

Students must complete a minimum of 6 months industrial attachment during the course of study. Students who have completed Certificate IV in Automotive Engineering or equivalent will be exempted.

#### **3.5 Delivery Mode**

The programme is full-time based on 15 weeks trimesters. Intakes are usually at the beginning of each academic year and students proceed from one trimester to another until trimester five. However, depending on the demand the college may allow new enrolment of students at the beginning of each trimester.

#### **3.6 Order of Delivery**

Units are timetabled according to the chronological order of the Programme Structure given in Table 1. Content material instruction is delivered chronologically as itemized in the Unit

Descriptors. Students who are unsuccessful in some units and need to re-sit examinations or repeat units must follow the below given guidelines:

- Prerequisites must be satisfied before proceeding to next units and
- Re-sits, repeat, and supplementary assessment will be allowed as per UASR guidelines.

The final outcome for graduation will be the accumulation of 262 credit points and mandatory 6 months industrial experience as recorded in the work experience record book.

**Table 1. Programme Descriptor for Trade Diploma in Automotive Engineering**

AUE	<b>Trade Diploma in Automotive Engineering</b>		
Minimum entry requirements (MER): 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.			
<b>Trimester 1</b>			
Unit Code	Unit Title	Pre- requisite	Credit Point
COM401	Technical Communication II	MER	10
MTH405	Engineering Mathematics I	MER	10
MEC450	Engineering Graphics	MER	4
PHY416 / CHM406	Engineering Physics / Engineering Chemistry	MER	8/8
CIN445 / EEE460	Introduction to Computer Programming / Introduction to Electrical and Electronics Engineering	MER	8/7
OHS445 / ETH401	Occupational Health and Safety / Introduction to Ethics Governance	MER	5/9
MEC470	Engineering Graphics Laboratory	MER	6
PHY470 / CHM470	Engineering Physics Laboratory / Engineering Chemistry Laboratory	MER	2/2
CIN470/EEE 470	Introduction to Computer Programming Laboratory / Electrical and Electronics Engineering Laboratory	MER	2/3
<b>Trimester 2</b>			
Unit Code	Unit Title	Pre- requisite	Credit Point
MEC451	Engineering Mechanics	MER	8
MTH504	Engineering Mathematics II	MTH 405	10
PHY416 / CHM406	Engineering Physics / Engineering Chemistry	MER	8/8
CIN445 / EEE460	Introduction to Computer Programming / Introduction to Electrical and Electronics Engineering	MER	8/7
OHS445 / ETH401	Occupational Health and Safety / Introduction to Ethics Governance	MER	5/9
EWP 452	Engineering Workshop Practice	MEC 450	5
MEC 472	Engineering Mechanics Laboratory	MER	2
PHY470 / CHM 470	Engineering Physics Lab / Engineering Chemistry Laboratory	MER	2/2
CIN470/ EEE470	Introduction to Computer Programming Laboratory / Electrical and Electronics Engineering Laboratory	MER	2/3

<b>Trimester 3</b>			
<b>Unit Code</b>	<b>Unit Title</b>	<b>Pre- requisite</b>	<b>Credit Point</b>
MEC 551	Engineering Analysis with MATLAB	MTH 504	6
MEC 552	Strength of Materials	MEC 451	7
AUE 501	Automotive Electrical/Electronic Systems	EEE 460	7
AUE 502	Applied Thermodynamics	PHY416 and CHM 406	7
MEC 558	Fluid Mechanics and Machinery	PHY 416	8
MEC 559	Engineering Materials	PHY416	8
MEC 571	Engineering Materials Laboratory	PHY 416	2
MEC 578	Mechanics of Fluid and Machinery Laboratory	PHY 416	2
AUE 570	Automotive Electrical/Electronic Systems Workshop	EEE 470	3
<b>Trimester 4</b>			
<b>Unit Code</b>	<b>Unit Title</b>	<b>Pre- requisite</b>	<b>Credit Point</b>
AUE 503	Principles of Automobile Manufacturing	MEC 559	7
AUE 504	Internal Combustion Engines	AUE 502	7
AUE 505	Automotive Engineering I	AUE 502	7
AUT 408	Transport Policy and Environment	CHM 406	8
MEC 564	Machine Design	MEC 552	7
MEC 565	Introduction to Solid Works	MEC470	7
AUE 571	Automobile Manufacturing Workshop	MEC 571	3
AUE 572	Internal Combustion Engines Workshop	MEC 578	2
AUE 573	Automotive Workshop Practice I	EWP 452	5
<b>Trimester 5</b>			
<b>Unit Code</b>	<b>Unit Title</b>	<b>Pre- requisite</b>	<b>Credit Point</b>
AUE 506	Automotive Engineering Project	AUE 573	7
AUE 507	Automotive Engineering II	AUE 505	7
AUE 508	Introduction to Mechatronics	AUE 501	7
AUE 509	Quality Assurance & Reliability Engineering	MTH 504	7
AUE 510	Instrumentation and Measurement in Automotive Engineering	AUE 501	7
AUT 506	Management for Engineers	AUT 408	8
AUE 574	Introduction to Mechatronics Workshop	AUE 570	2
AUE 575	Instrumentation and Measurement in Automotive Engineering Laboratory	AUE 570	2
AUE 576	Automotive Workshop Practice II	AUE 573	3

## **4.0 ASSESSMENT**

### **4.1 Assessment Philosophy**

Assessment is broken down into formative and summative components. Details are expanded below.

### **4.2 Methods of Assessment**

Formative assessment takes the form of projects and assignments, classroom exercises and laboratory practical. Summative assessment takes the form of formal tests. Theoretical units also carry a final examination. Marking weightings for the various components are detailed in each Unit Descriptor.

### **4.3 Criteria for Assessment**

Skills assessed are: cognitive, communication and motor through tests, assignments, presentations and practical work respectively. Projects are used as a gauge to measure planning and organizational skills as well as self/collective motivation. Minimum passing requirements are:-

- Coursework                      50%
- Examination                      50%
- Attendance                      75%

### **4.4 Fairness, Validity and Reliability**

The programme contains mainly examinable units in order to provide fair assessment across a wide range of academic abilities. Examinable units provide a high degree of objectivity whereas the few non-examinable units provide a measure of non-quantifiable personality factors through a more subjective approach such as a student's conscientiousness, inter-relations with peers and superiors and general attitude towards work.

Each unit carries at least one summative test. Marks for these and other forms of course work are entered onto the program record spreadsheet which is submitted to the Examination Board for scrutiny. Examinable units have their question papers moderated prior to submission to the Board. The answer sheets are assessed for its correctness and consistency in marking before

finalization of results. The results are later scrutinized by the Examination Board prior to submission to the Academic Board.

Definitions of Boards and other quantifiable assessment criteria and validation requirements are explained in full in the University Academic and Student Regulations.

## **5.0 TEACHING AND LEARNING METHODS**

### **5.1 Introduction**

The teaching methods used will consist of a variety of techniques in order to achieve the specified learning outcomes. The teaching methods used will generate a learning environment whereby the practical skills and theoretical knowledge are integrated so that the students can competently meet the requirements of their work situations.

The teaching methods will include the following:

- (a) Appropriate amount of classroom time, reference books and written resources.
- (b) An optimal combination of assignments, tutorials, quizzes and projects.
- (c) Use of computers, sensors and measuring instruments to illustrate and demonstrate the systematic representation of concepts.
- (d) Final project will be used to facilitate the development of independent learning skills interpersonal skills, leadership and organizational skills.
- (e) Industrial Visits- (Melbourne Industrial tour is highly recommended (not mandatory) in order to visit vehicle assembly plants in Melbourne Victoria (Australia)).
- (f) Local industry visits to witness the various quality control and manufacturing processes.

### **5.2 Student Centered Learning**

The program lays emphasis on a student centered learning process where in all the teaching methods focus on developing an all-round graduate engineer who is competent in their profession and at the same time is sensitive to the requirements of his/her society and environment. The program helps in developing analytical skills in the students so that they are able to source information on their own, categorize, analyze and develop a range of solutions from which they can choose an optimal solution that best fits the given problem.

## **6.0 MONITORING, EVALUATING AND REVIEW OF PROGRAMME**

### **6.1 Academic Board**

The Academic Board composition is detailed in the University Academic and Student Regulations. The board is responsible to review, discuss and amend programme curricula in their periodic meetings.

### **6.2 Examination Board**

The Examination Board composition is detailed in the University Academic and Student Regulations. The board reviews, discusses and if required, amends individual results by consensus at the end of every trimester.

### **6.3 On-going Monitoring**

The Academic Board reviews programme curricula and make adjustments according to various inputs as detailed in the UASR.

### **6.4 External Moderation**

Final stage papers may be externally moderated by experts in appropriate fields from time in accordance with UASR guidelines.