SECTION A						
QUALIFICATION DEVELOPER	**GABORONE UNIVERSITY COLLEGE OF LAW AND PROFESSIONAL STUDIES**					
TITLE	**DIPLOMA IN MOTOR VEHICLE MECHANICS**			**NCQF LEVEL**		**6**
FIELD	**MANUFACTURING, ENGINEERING AND TECHNOLOGY**		**SUB-FIELD**	**MOTOR VEHICLE MECHANICS**		
New qualification	✓		Review of existing qualification			
SUB-FRAMEWORK	General Education		TVET	✓	Higher Education	
QUALIFICATION TYPE	Certificate		Diploma	✓	Bachelor	
	Bachelor Honours		Master		Doctor	
CREDIT VALUE					**369**	

RATIONALE AND PURPOSE OF THE QUALIFICATION

Rationale:

A number of national policies and strategies have for years pointed out to the need to improve the quality of and expand TVET in Botswana. These include the:

Revised National Policy on Education (1994), which called for “provision of more practical and work-related subjects and support for cross curriculum approach”

National Policy on Vocational Education and Training (NaPVET) of 1997, which stated among other things that “involve stakeholders in the provision of vocational education and training through joint responsibility for planning, designing, monitoring, financing and implementing programme, providing quality resources”.

Human Resource Development Council (HRDC) is the main authority in Botswana for determining priority skills needed by the economy for now and for the future. They do this in close collaboration with respective industries, both public and private sector, and there is no better authority than this to guide qualifications

and programmes development to address needs of the economy. In their (HRDC) December 2016 document titled **"Top Occupations in High Demand"** and their subsequent March 2019 document titled **"Priority Skills (Current and Future)"** it is clear that Motor Vehicle Mechanics is an occupation in high demand and will continue to be required for the foreseeable future, or at least up to the year 2028. Some of the identified top occupations in demand include Engineering Professionals with specific skills areas under Mechanical Engineering Technicians. They identified Mechanics falling under Top 20 Occupations and covering specializations such as Heavy Plant Mechanic, Hydraulics Mechanic, Diesel Mechanic and Auto Electricians, intended soft skill are Management, Teamwork, Supervisory, Health & Safety and Environment.

The proposed qualification possesses the professional, interpersonal, and personal management skills necessary for a career in Automotive Maintenance and workshop management. The qualification develops the graduates to have awareness of their civic responsibilities and their role in sustaining and preserving the environment, as well as managing natural resources. The qualification is intended to train highly skilled technicians, knowledgeable in the implementation, management of automotive repair workshops.

Purpose:

The proposed qualification, Diploma in Motor Vehicle Mechanics should enable learners to have an overall view of automobiles before learning the detailed aspects of various systems of automobile. This qualification provides a broad knowledge and comprehensive skills in the power plant, electrical system, transmission, final drive, braking system, front axle, steering, frame and chassis. This knowledge and skills will be helpful to the learners in co-relating various systems with each other and understanding the individual systems in a better manner. The Diploma in Motor Vehicle Mechanics will produce mechanics who are competent, proactive, professional, enterprising, and motivated to develop innovative ways of carrying out their work.

Graduates of this qualification will be able to:

1. Communicate effectively with customers and staff in an automotive workshop.
2. Solve problems in an automotive workshop.
3. Manage work activities in an automotive context.
4. Diagnose and repair specialised vehicle systems

ENTRY REQUIREMENTS

Entry requirements:

i. Certificate IV, NCQF Level 4 or equivalent
ii. Access through RPL and CAT will be provided through ETP policies in line with National RPL and CAT Policies

QUALIFICATION SPECIFICATION: SECTION B	
GRADUATE PROFILE	**ASSESSMENT CRITERIA**
1. Demonstrate advanced knowledge in disassembling and installing automotive components	1.1 Dismantle components in accordance to manufacturer specifications. 1.2 Assemble and clean components according to organizational requirements. 1.3 Determine when a component should be serviced or replaced. 1.4 Utilize tools and equipment in accordance with their design.
2. Demonstrate advanced knowledge of how automotive engines operate.	2.1 Diagnose various types of automotive engines by operation and fuel type. 2.2 Synthesize the operation of major components in an automotive engine. 2.3 Determine engine performance in relation to its size and economy. 2.4 Examine using scientific principles of force, power and energy the way the source of power is converted to mechanical power.
3. Demonstrate understanding of motor vehicle electrical systems	3.1 Diagnose electrical problems of a motor vehicle. 3.2 Prepare material and component list required following diagnosis. 3.3 Correct electrical faults in a motor vehicle. 3.4 Test performance of fitted components.
4. Communicate effectively in an automotive work context.	4.1 Demonstrate understanding of using job cards and explain same to customers. 4.2 Prepare and produce technical reports and present them to stakeholders. 4.3 Interpret a range of written and oral sources to ensure that work requirements are understood
5. Set up business/practice rather than looking for employment and have the basic principles of setting up and running a	5.1 Demonstrate through knowledge in setting up a motor vehicle repairs business. 5.2 Demonstrate through knowledge in all the preliminary processes required when setting up

business	business. 5.3 Assess and interpret different grades of automotive engineering workshops. 5.4 Manage a small-scale automotive repairs workshop or company.
6. Apply knowledge on the use of computers in graphic design and have understanding on how to create and edit 2-dimensional drawings as well on how to create and edit 3-dimensional drawings	6.1 Draw basic diagrams using auto cad draw and modifying commands. 6.2 Apply and use database information for objects in order to modify, store, manipulate and detailing. 6.3 Work with line type styles, modify and manipulate line sizes.
7. Demonstrate ability to operate equipment and use tools correctly and conduct maintenance of automotive workshop tools and equipment	7.1 Select tools and equipment used according to manufacturer operating guidelines. 7.2 Apply organizational procedures to source and procure tools from suppliers. 7.3 Identify faulty tools and take corrective action in accordance with workplace procedures.
8. Apply health, safety and security procedures on the workplace	8.1 Observe Health and Safety procedures at all times. 8.2 Illustrate the consequences of exposure and poor adherence to health and safety requirements as described in terms of the impact on people and the organization. 8.3 Address workplace hazards and risks in accordance with workplace specific health and safety requirements. 8.4 Implement safety and hygiene standards applicable to the industry and market.

QUALIFICATION STRUCTURE: SECTION C			
FUNDAMENTAL COMPONENT Subjects / Units / Modules /Courses	**Title**	**Level**	**Credits**
	Mathematics	5	10
	Engineering Science	5	10
	Technical Communication	5	10
	Mathematics	6	10
	Basic Technical Drawing	5	10
	Engineering Science	6	20
	Entrepreneurial Skills	6	10
	Computer Fundamentals	6	10
CORE COMPONENT Subjects / Units / Modules /Courses	Materials Technology	6	10
	Workshop Organization and Administration	6	15
	Motor Vehicle Practical	6	60
	Motor Vehicle Technology	5	15
	Workshop Technology	6	12
	Motor Vehicle Technology	6	24
	Motor Vehicle Transmission System	6	15
	Pneumatic and Hydraulic Systems	6	15
	Computer aided drafting	6	12
	Vehicle electrical and electronic systems	6	12
	Machine element design	6	12
	Project	6	25
	Industrial attachment	6	40
	Select ONE		
ELECTIVE COMPONENT Subjects / Units / Modules /Courses	Maintenance management	6	12
	Basic Engineering Management	6	12
	Total		**369**

Rules of combinations, Credit distribution

Credits are distributed according to workload and requirements of each module. The credit combination as follows:

Fundamental component- 90 credits

Core component- 267 credits

Elective component- 12 credits

Level 5 – 55 credits

Level 6 - 314 credits

Total 369 credits

ASSESSMENT AND MODERATION ARRANGEMENTS

Assessment and moderation shall be conducted by BQA registered assessors and moderators.

Assessment

The formative assessment shall consist of CAs which together will make 60%

Summative assessment shall make up the remaining 40%.

Moderation

All assessment tools shall undergo internal and external moderation. The internal and external moderation shall be conducted as ETP policies which must be aligned with the National policies.

RECOGNITION OF PRIOR LEARNING

There will be provision of RPL for award of the qualification through the use of ETP RPL Policy in line with the National RPL Policy.

CAT will be considered award of qualification.

PROGRESSION PATHWAYS (LEARNING AND EMPLOYMENT)

LEARNING PATHWAYS

Horizontal

- Diploma in Mechanical Engineering
- Diploma in Heavy Plant Engineering
- Diploma in Instrumentation
- Diploma in Business

Vertical:

- Bachelor of Automotive Engineering
- Bachelor's Degree in Automobile Maintenance Technology
- Bachelor's Degree in Mechanical Engineering

EMPLOYMENT PATHWAYS

- Workshop Manager
- Motor Vehicle Mechanic Technician
- Automotive workshop foreman
- Motor vehicle mechanic instructor

Notwithstanding the above, the graduate can also start up a business for vehicle service and repair workshop.

QUALIFICATION AWARD AND CERTIFICATION

Upon successful completion the candidate will be awarded a qualification of Diploma In Motor Vehicle Mechanics and issued transcript and certificate. The total minimum credit required for the award of this qualification is 369.

REGIONAL AND INTERNATIONAL COMPARABILITY

This qualification has been benchmarked against the following qualifications, regionally and internationally: National Diploma: Automotive Diagnostics and Repair (SAQA, South Africa), Diploma in Motor Mechanics (Zambia) and Level 5 IVQ Advanced Technician Diploma in Automotive Engineering (UK).

COMPARABILITY:

Similarities- all the Diplomas have a component of mathematics, communication skills, workshop practices and management, and practical modules. The entry requirements of the benchmarked qualifications are similar to this qualification as when mapped into the NCQF, they equate to NCQF Level 4.

Differences- the SAQA qualification does not spell out modules to be covered but exit level outcomes. This qualification is based on SAQA registered unit standards. Credit allocation of the qualifications differs: SAQA qualification has 240, Northern Technical College is not credit based and City and Guilds is also not credited.

In purview of the above, Diploma in Motor Vehicle Mechanics has a cut above all the noted qualifications in that it brings out a well-balanced learner in the subfield of Motor Vehicle Mechanics.

The comparability table below further show how this qualification compares well with other qualifications which were benchmarked against regionally and internationally:

Institution	SAQA (South Africa)	Northern Technical College (Zambia)	CITY AND GUILDS (UK)
Qualification	National Diploma: Automotive Diagnostics and Repair	Diploma in Motor Mechanics	Level 5 IVQ Advanced Technician Diploma in Automotive Engineering
Credits	240	not credit based	not specified but uses total qualification time which is 1200
Entry requirements	NQF Level 4 with competence in Communication and Mathematical Literacy	National Certificate in Automotive Engineering plus 5 “O” Levels including English, Mathematics and Science.	Level 3 IVQ Technician Diploma in Motor Vehicle Systems or equivalent.
Exit level outcomes/Modules	• Communicate and solve problems in a variety of ways • Manage work in an automotive context • Diagnose and repair vehicles in a specialised area (in Passenger and Light Delivery Vehicles; Earthmoving Equipment or Commercial Vehicles.	• Motor vehicle Technology • Engineering Science • Engineering Mathematics Engineering • Drawing • Communication skills • Workshop practice • Workshop process and Management.	• Mathematics, Science and Electronics • Vehicle Systems Practical • Engine Systems • Chassis Systems • Practical • Motor Vehicle Engineering Project • Diesel Engines and Fuel Systems • Heavy Vehicle Chassis

				Systems • Heavy Vehicle Transmission Systems • Electrical and Electronic Systems • Service Reception in Motor Vehicle Engineering

REVIEW PERIOD

The qualification will be reviewed after 5 years. However, the qualification may be reviewed any time sooner than 5 years as and when it becomes necessary