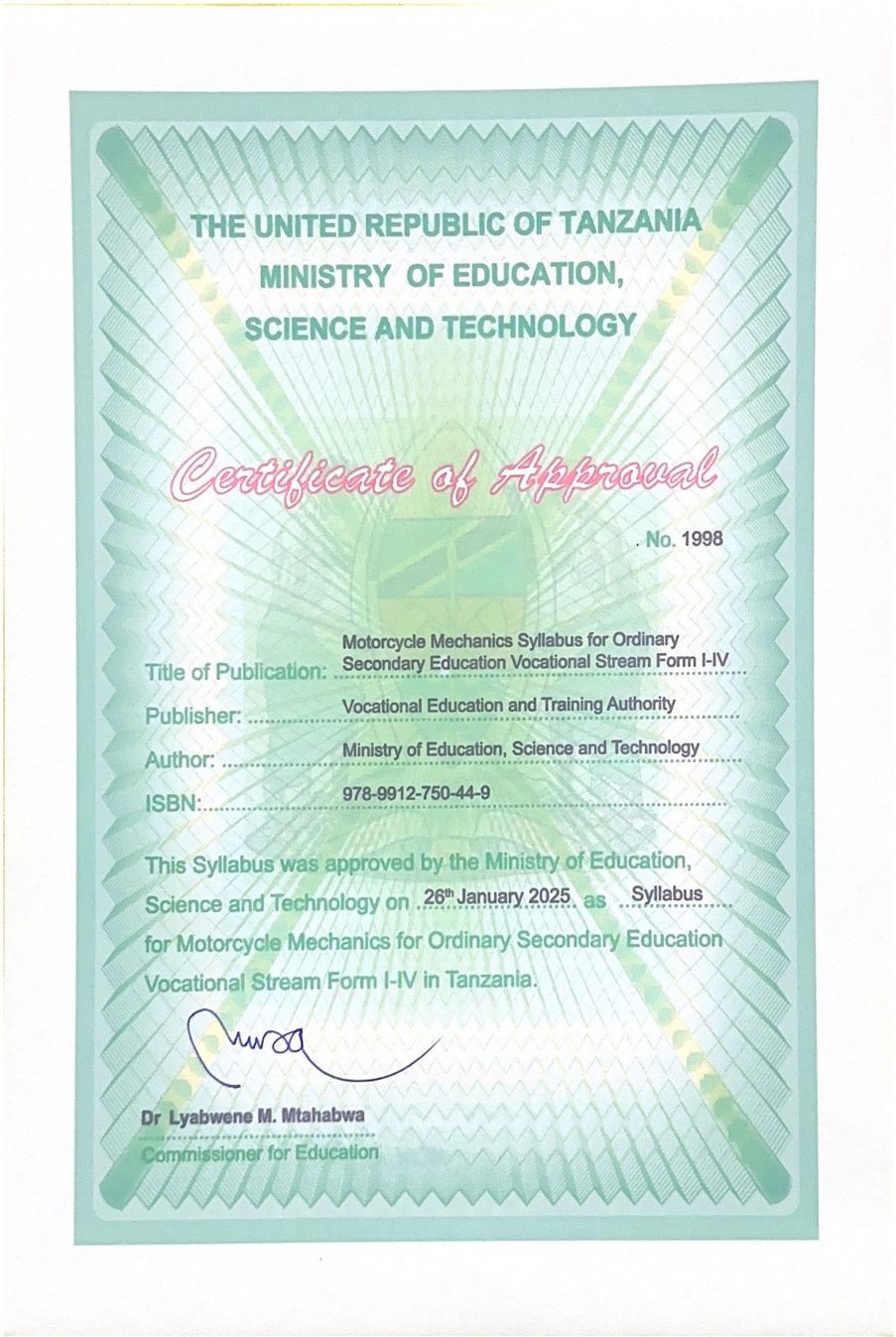
THE UNITED REPUBLIC OF TANZANIA

MINISTRY OF EDUCATION, SCIENCE AND TECHNOLOGY



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Dr Lyabwene M. Mtahabwa
Commissioner for Education

MOTORCYCLE MECHANICS SYLLABUS FOR ORDINARY SECONDARY EDUCATION VOCATIONAL STREAM FORM I-IV

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Abbreviations and Acronyms

AC	Alternating Current
CBET	Competence Based Education and Training
DC	Direct Current
EET	Entrepreneurship Education Training
MCM	Motorcycle Mechanics
OHS	Occupation Health and Safety
OSHA	Occupation Safety and Health Authority
PM	Preventive Maintenance
RLC	Resistance Inductor and Capacitance
VETA	Vocational Education and Training Authority
CAD	Computer Aided Designing
CAL	Computer Aided Learning
CBET	Competence-Based Education and Teaching
TIE	Tanzania Institute of Education
VETA	Vocational Education and Training Authority

Definition of Key Terms

Assessment: The process of collecting evidence and making judgments on whether competency has been achieved, or whether specific skills and knowledge have been achieved that will lead to the attainment of competency.

Circumstantial knowledge: Detailed knowledge, which allows the decision-making in regard to different circumstances and cross cutting issues.

Competence: The ability to use knowledge, understanding, practical and thinking skills to perform effectively to the workplace standards required in employment.

Element: A sub- unit (step), which reflects learning sequence with the aim of achieving broad learning objectives of a unit.

Performance criteria: Indicate the expected end results or outcome in form of evaluative statements.

Standard: A set of statements, which if proved true under working conditions, means that an individual is meeting an expected level and type of performance.

Underpinning Knowledge: This is essential knowledge needed in order to demonstrate competences that are associated in performing a given task.

Unit: A statement of broad learning objectives, which prescribe the requirements of a standard in form of practical skills, knowledge and appropriate attitudes.

Acknowledgements

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For and on behalf of:
Vocational Education and Training Authority

CPA. Antony M. Kasore
Director General

1.0 Introduction

Motorcycle Mechanics is one of the occupations taught in the Ordinary Secondary Education Vocational Stream. Learning *Motorcycle Mechanics* is important to Tanzanian youths because motorcycle transport is among highly preferred mode of transportation. Due to its low cost, ease of parking, and ability to navigate congested roads; motorcycles have made products and services delivery more available especially in areas with poor infrastructure. Motorcycles highly contribute to the livelihood of the youths in the form of business and hence influences other economic activities undertaken by youths. These advantages related to usage of motorcycles, can be leveraged to support the country's economy by fostering job creation and hence economic development.

Upon completion of the program, students will possess both theoretical and practical knowledge of motorcycle mechanics being capable of diagnosing, servicing and repairing different types of motorcycles and tricycles. A graduate of this occupation may be employed in both Government and private sectors such as ministries/departments, training institutions, research institutions, self-employment, small, medium and large motorcycle industries and in Non-Governmental Organizations (NGOs).

The Motorcycle Mechanics Syllabus is designed to guide the teaching and learning of Motorcycle Mechanics at Ordinary Secondary Education Form I-IV Vocational Stream in the United Republic of Tanzania. The syllabus interprets the competences a student needs to develop while learning Motorcycle Mechanics. It contains valuable information that will enable teachers to effectively plan their teaching process and help learners to develop the intended competences

2.0 Main Objectives of Education in Tanzania

The main objectives of education in Tanzania are to enable every Tanzanian to:

(a) Develop and improve his or her personality so that he or she values himself or herself and develops self-confidence;

(b) Respect the culture, traditions, norms and customs of Tanzania; cultural differences; dignity; human rights; attitudes and inclusive actions;

(c) Advance knowledge and apply science and technology, creativity, critical thinking, innovation, cooperation, communication and positive attitudes for his or her own development and the sustainable development of the nation and the world at large;

(d) Understand and protect national values, including dignity, patriotism, integrity, unity, transparency, honesty, accountability and the national language;

(e) develop life and work-related skills to increase efficiency in everyday life;

(f) Develop a habit of loving and valuing work to increase productivity and efficiency in production and service provision;

(g) Identify and consider cross-cutting issues, including the health and well-being of the society, gender equality, as well as the management and sustainable conservation of the environment; and

(h) Develop national and international cooperation, peace and justice per the Constitution of the United Republic of Tanzania and international

conventions.

3.0 General Competencies for Ordinary Secondary Education Vocational Stream

The general competences for Ordinary Secondary Education, Form 1–IV, Vocational Education stream are to:

(a) Apply the knowledge, skills and attitudes the student developed in the primary school stage to increase his/her understanding of technical skills;
(b) Apply technical skills in designing, inventing and making various things to cope with life and solve challenges in society;
(c) Appreciate citizenship and national virtues;
(d) Use language skills;
(e) Demonstrate self-confidence in learning in various fields, including science and technology, technical knowledge and technical skills;
(f) Apply technical knowledge and skills in designing, discovering and making various things to solve challenges in society, including cross cutting issues;
(g) Appreciate procedures and safety rules in using technical tools correctly; and
(h) Apply the technical knowledge and skills acquired to develop oneself with vocational and technical education and join the workforce.

4.0 General Competences of the Occupation

Upon completion of this occupation, students are expected to have ability to:

(a) Maintain health, safety and environment at work place;
(b) Perform services on motorcycle systems;
(c) Troubleshoot motorcycle faults;
(d) Cary out repairs on parts and components of motorcycles and tri circles;
(e) Manage workshop activities;

5.0 Main and Specific Competences

The main and specific competences to be developed are presented in Table 1

Table 1: *Main and Specific Competences for Form I-IV*

Main Competence	Specific competences
1.0 Maintaining health, safety and environment at work place	1.1 Maintaining workshop safety 1.2 Handling accidents and incidents 1.3 Handling fire accidents 1.4 Performing first aid
2.0 Performing preventive maintenance of tools, machines and equipment	2.1 Conducting preventive maintenance of work tools 2.2 Conducting preventive maintenance of workshop machines
3.0 Building simple electric circuits	3.1 Constructing simple electric circuits 3.2 Measure electric quantities
4.0 Performing bench work	4.1 Performing cutting 4.2 Performing filing

Main Competence	Specific competences
	4.3 Performing drilling 4.4 Performing riveting 4.5 Performing threading 4.6 Performing metal forming
5.0 Performing welding processes	5.1 Performing arc welding 5.2 Performing gas welding 5.3 Performing soldering
6.0 Building simple electronic circuits	6.1 Determining characteristics of active electronic components 6.2 Determining characteristics of passive electronic components 6.3 Constructing simple electronic circuits
7.0 Carrying out engine service	7.1 Performing engine maintenance 7.2 Performing engine cooling system service 7.3 Performing fuel system service
8.0 Carrying out repairing of wheel and tyres	8.1 Performing tyres service 8.2 Repairing tube and tubeless tyres 8.3 Performing wheel balance 8.4 Aligning wheels 8.5 Servicing wheel
9.0 Performing service of steering and suspension systems	9.1 Performing steering system service 9.2 Performing suspension system service
10.0 Performing service of transmission system	10.1 Performing service of gear box 10.2 Performing clutch system service 10.3 Maintaining chain and sprockets 10.4 Performing drive shaft and final drive service
11.0 Carrying out chassis service	11.1 Maintaining three wheeled body 11.2 Carrying out side car body maintenance 11.3 Maintaining motorcycle chassis
12.0 Maintaining brake system	12.1 Maintaining front disc brake 12.2 Performing front cable brake maintenance 12.3 Maintaining drum brake
13.0 Carrying out general maintenance on electrical and electronic systems	13.1 Performing battery maintenance 13.2 Servicing electrical and electronic circuits 13.3 servicing conventional ignition systems 13.4 Servicing light system 13.5 Servicing accessories circuits and components
14.0 Maintaining emission control	14.1 Servicing catalytic converter

Main Competence	Specific competences
system	14.2 Servicing oxygen sensor 14.3 Repairing exhaust system components
15.0 Carrying out engine repairing	15.1 Dismantling engine 15.2 Repairing engine components
16.0 Repairing transmission system	16.1 Carrying out gear box dismantling 16,2 Carrying out repair of gear box
17.0 Managing safe work environment	17.1 Managing hazards 17.2 Carrying out risk assessment 17.3 Managing environment
18.0 Managing preventive maintenance	18.1 Planning preventive maintenance 18.2 Supervising preventive maintenance
19.0 Troubleshooting motorcycle faults	19.1 Troubleshooting engine faults 19.2 Tracing electrical system faults
20.0 Managing workshop activities	20.1 Designing workshop layout 20.2 Controlling tools and equipment 20.3 Estimating material and labour cost 20.4 Training subordinates 20.5 Preparing reports 20.6 Preparing reports

6.0 The Roles of Teachers, Students and Parents in Teaching and Learning

Good relationships between a teacher, student and parent, or guardian is fundamental to ensuring successful learning. This section outlines the roles of each participant in facilitating effective teaching and learning of Motorcycle mechanics.

6.1 The teacher

The teacher is expected to:

(a) Help the student to learn and develop the intended competences in motorcycle mechanics.

(b) Use teaching and learning approaches that will allow students with different needs and abilities to:

(i) Develops the competences needed in the 21st Century; and

(ii) Actively participate in the teaching and learning process.

(c) Use student centred instructional strategies that make the student a centre of learning which allow them to think, reflect and search for information from various sources;

(d) Create a friendly teaching and learning environment;

(e) Prepare and improvise teaching and learning resources;

(f) Conduct formative assessment regularly by using tools and methods which assess theory and practice;

(g) Treat all the students according to their learning needs and abilities;

(h) Protect the student from the risky environment while he or she is at school;
(i) Keep track of the student's daily progress;
(j) Identify individual student's needs and provide the proper intervention;
(k) Involve parents/guardians and the society at large in the student's learning process; and
(l) Integrate cross-cutting issues and ICT in the teaching and learning process.

6.2 The student

The student is expected to:

(a) Develop the intended competences by participating actively in various learning activities inside and outside the classroom; and
(b) Participate in the search for knowledge from various sources, including textbooks, reference books and other publications in online libraries.

6.3 The parent/guardian

The Parents/Guardian is expected to:

(a) Monitor the child's academic progress in school;
(b) Where possible, provide a child with the needed academic support;
(c) Provide a child with a safe and friendly home environment which is conducive for learning;
(d) Keep track of a child's progress in behaviour;
(e) Provide the child with any necessary materials required in the learning process; and
(f) Instill in a child a sense of commitment and positive value towards education and work.

7.0 Teaching and Learning Methods

The teaching and learning methods are instrumental in developing student's competences. This Syllabus suggests teaching and learning methods for each activity which includes but not limited to demonstration, practical/hands-on activities, observations, simulation, group works, , discussions, inviting guest professional, presentations, and project works. However, a teacher is advised to plan and use other appropriate methods based on the environment or context. All the teaching and learning methods should be integrated with the everyday lives of students. The focus is expected to be on practical application and developing cognitive, affective, and psychomotor skills through learner-centred methods. Vocational teachers act as facilitators, incorporating both school base teaching and project work supervision.

8.0 Teaching and Learning Resources

The process of teaching and learning requires different resources. In that regard, both a teacher and students should work together to collect or improvise alternative resources available in the school and home environment when needed. Teachers and students are expected to constantly seek for information from various sources to effectively

facilitate the teaching and learning process. The list of approved textbooks and reference books shall be provided by the TIE.

9.0 Assessment

Assessment is important in teaching and learning of Motorcycle Mechanics occupation. It is divided into formative and summative assessments. Formative assessment informs both the teacher and students on the progress of teaching and learning, and in making decisions on improving the teaching and learning process. Teachers are therefore, expected to apply a wide range of formative assessment methods which include but not limited to demonstration, discussions, presentations, oral questions, experiments, observations, practical assignments and projects.

Summative assessment, on the other hand, will focus on determining student's achievement of learning. Teachers are expected to use a variety of summative assessments including Form Two National Assessment, terminal examination, annual examination, mock examination and project. The scores obtained from these assessments will be used as Continuous Assessment (CA). Therefore, the continuous assessments shall contribute 60% and the National Form IV Examination shall be 40% as indicated in Table 2.

9.1 Project Work

Project work is a carefully planned and clearly defined task or problem that a student undertakes, either alone or in a group, to enhance and apply the skills and knowledge gained in the classroom, workshop, kitchen, or laboratory. It is based on the principles of "Learning by Doing" and "Learning by Living." In this context, the implementation of Project Work in secondary schools' vocational streams is essential. Projects in the vocational stream should be conducted in the core subject (occupation). To ensure its success, the supervision and assessment of student project work must be consistent with the established guidelines provided by National Examinations Council of Tanzania (NECTA).

Table 2: *Contribution of Continuous Assessment and National Examination in the final score*

Assessment Category	**Weight (%)**	**National Examination**
Form Two National Assessment (FTNA)	6.0	**40**
Form Three Terminal Examination	5.0	
Form Three Anual Examination	5.0	
Form Four Mock Examination	7.0	
Project	7.0	
Form Two Practical	10.0	
Form Three Practical	10.0	
Form Four Practical	10.0	
Total	**60**	

10.0 Number of Periods

The Motorcycle Mechanics Syllabus for Ordinary Secondary Education Vocational Stream Form I-IV provides time estimates for teaching and learning each specific competence. The estimates consider the complexity of the specific competences and the learning activities. Eight (08) periods of 40 minutes each have been allocated per week, whereby two (02) periods will be used for theory and 6 for practical sessions which may require double periods (e.g., 80). Double periods will allow sufficient time for hands-on activities.

11. Teaching and Learning Contents

The contents of the Syllabus are organized into a matrix with seven (07) columns which are main competences, specific competences, learning activities, suggested teaching and learning methods, assessment criteria which is dived into (process assessment, products/service assessment and underpinning knowledge), suggested teaching and learning resources and number of periods as presented in Table 3 to 6.

Form One

Table 3: *Detailed contents for Form One*

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			learning Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
1.0 Maintaining health, safety and environment at work place	1.1 Maintaining workshop safety	(a) Maintaining workshop safety rules	**Discussion,** Guide the student to discuss in groups on how to: Maintain workshop safety rules and principles and introduce to them OSHA guidelines **Demonstration** demonstrates to students through hands on activity how to maintain workshop safety rules **Hands on activity** Organise the students to demonstrate maintaining workshop safety rules	**The student should be able to**: •Select relevant safety gears •Maintain workshop safety •Identify causes of health and safety hazards in a workshop and its surroundings •Take precautions against health and safety hazards	Workshop rules and regulations maintained as per OSHA guidelines.	**Knowledge evidence: Detailed knowledge of:** **Method used:** The student should explain how to: Maintaining workshop safety rules **Principles:** The student should explain principles of: Maintaining workshop safety rules **Theories:** The student should explain: - Importance of maintaining workshop rules. **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while handling mechanical	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available: -** • Personal protective Equipment • Workshop rules and regulations • OSHA guidelines • Guidelines • Service manual	79

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			learning Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
						hazards • Safe handling of tools, equipment and machines • Proper waste disposal		
		(b) Maintaining workshop working environment	**Discussions:** Guide the student to discuss on Maintaining workshop working environment. **ICT based learning approach** guide the students through ICT learning approach to describe ways of maintaining workshop working environment **Demonstrations** Demonstrate to the students on Maintaining workshop working environment	**The student should be able to**: •Interpret different safety signs in a workshop •Draw safety signs •Maintain safe working environment •Maintain personal safety •Clean workshop, tools, equipment and workshop surroundings	Safety of workshop and tools maintained as per safety rules and regulations.	**Knowledge evidence: Detailed knowledge of:** **Method used:** The student should explain how to: • Maintain workshop working environment •Clean workshop, tools, equipment and machines safely. **Principles:** The student should explain principles of: • Workshop cleaning • Storing different types of tools and equipment used in the occupation. **Theories:** The student should explain: - • Possible workshop	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available: -** • Personal protective Equipment • Air compressor • Workshop rules and regulations guidelines. • waste disposal system • Computers and internet connectivity	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			learning Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			Hands on activity Organise the students to clean workshop, environment, tools, equipment and machines safely			accidents and their causes and prevention • Methods of disposing different types of wastes • Classification of wastes and their hazards **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while handling mechanical hazards • Safe handling of tools, equipment and machines Proper waste disposal		
		(c)Maintaining personal safety.	**Discussions:** Guide the student to discuss on purpose of each safety gear and personal safety while in workshop	The student should be able to: •Use safety gears •Dispose different types of wastes as per OHS •Store tools, equipment and	Safety of workshop and tools maintained as per safety rules and regulations.	**Knowledge evidence:** **Detailed knowledge of:** **Method used**: The student should explain how to: Maintain personal safety while in	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available: -**	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			learning Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			Interactive simulation and animation Guide the student through interactive simulation and animation to visualise how to Maintain personal safety. **Demonstrations** Demonstrate to the students on maintaining personal safety. **Hands on activity** Organise the students to maintain personal safety. using safety gears and dispose different types of wastes as per OSHA guide line	safety gear		workshop **Principles:** The student should explain principles of: Purpose of each safety gear **Theories:** The student should explain: - • Possible workshop accidents and their causes and prevention • Methods of disposing different types of wastes • Classification of wastes and their hazards. **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while handling mechanical hazards • Safe handling of tools, equipment and machines	• Personal protective Equipment • Proper tool kit • Workshop rules and regulations/ guideline • Internet connectivity	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			learning Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
						Proper waste disposal		
	1.2 Handling accidents and incidents	(a) Handling mechanical hazards	**Discussions:** Guide the student to discuss how to: Identify mechanical hazard. **Demonstrations** Demonstrate to the students on handling mechanical hazards **Hands on activity** Organise the students to handle mechanical hazards by identify and apply emergency equipment and supplies available in the workshop	**The student should be able to:** •Use service manual •Interpret workshop rules and regulations •Identify and apply all emergency equipment and supplies •Locate first aid kit •Report to superiors •Clean tools, equipment and workplace •Store tools and equipment	Mechanical hazards handle as per safety rules and regulations	**Knowledge evidence: Detailed knowledge of: Method used:** The student should explain how to: • Identify mechanical hazard. • Handle mechanical hazards • Use safety gears **Principles:** The student should explain the principles of: • Handling mechanical hazards • Identifying hazard materials **Theories:** The student should explain: - Effects of mechanical, hazards. **Circumstantial knowledge**	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available: -** • Tool kit • Safety clear glasses • Workshop rules and regulations guidelines • Service manual • Personal Protective Equipment	78

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			learning Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
						Detailed knowledge about: • Safety precautions while handling mechanical hazards • Safe handling of tools, equipment and machines • Proper waste disposal		
		(b) Handling Physical hazards	**Discussions:** Guide the student to discuss how to: Identify physical hazard **Demonstrations** Demonstrate to the students on handling physical hazards **Hands on activity** Organise the students to handle physical hazards by Making inspection of	**The student should be able to:** •Use service manual •Interpret workshop rules and regulations •React correctly and safely when faced with a n emergency •Locate first aid kit •Report to superiors •Make periodic inspection of workshop area and equipment •Identify hazard material •Handle hazard	Physical hazards handle as per safety rules and regulations	**Knowledge evidence: Detailed knowledge of: Method used: The student should explain how to:** •Handle physical hazard. **Principles:** The student should explain the principles of: Handling physical hazards **Theories:** The student should explain: - •Effects of physical hazards. **Circumstantial knowledge**	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available: -** • Tool kit • Workshop rules and regulations guidelines • Service manual • Personal Protective Equipment	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			learning Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			workshop area and equipment and reporting	material •Handle mechanical and electrical equipment •Clean tools, equipment and workplace •Store tools and equipment		**Detailed knowledge about:** •Safety precautions while handling physical hazards •Safe handling of tools, equipment and machines •Proper waste disposal		
		(c) Handling chemical hazards	**Discussions:** Guide the student to discuss how to: handle chemical hazard **Demonstrations** Demonstrate to the students on handling chemical hazards **Hands on activity** Organise the students to handle chemical hazards by Making inspection of workshop area and equipment and reporting to the superior	**The student should be able to:** •Use service manual •Interpret workshop rules and regulations •React correctly and safely when faced with a n emergency •Identify and apply all emergency equipment and supplies •Locate first aid kit •Follow compressed air rule Handle machines •Observe safety precaution	Chemical hazards handle as per safety rules and regulations	**Knowledge evidence: Detailed knowledge of: Method used:** **The student should explain how to:**. •Handle chemical hazards •Use safety gears. **Principles:** The student should explain the principles of: •Handling chemical hazards •Identifying hazard materials **Theories:** The student should explain: - •Effects of chemical hazards **Circumstantial**	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available: -** • Tool kit • Safety clear glasses • Workshop rules and regulations guidelines • Service manual • Personal Protective Equipment	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			learning Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
						knowledge **Detailed knowledge about:** •Safety precautions while handling chemical hazards •Safe handling of tools, equipment and machines •Proper waste disposal		
		(d) Handling electrical hazards	**Discussions:** Guide the student to discuss how to: handle electrical hazard. **ICT based learning approach** guide the students through ICT learning approach to describe ways of handling electrical hazards **Hands on activity** Organise the students to handle electrical hazards by identifying and	**The student should be able to**: •Interpret workshop rules and regulations •React correctly and safely when faced with a n emergency •Identify and apply all emergency equipment and supplies •Locate first aid kit •Report to superiors •Make periodic inspection of workshop area and equipment to identify hazard	Electrical hazards handle as per safety rules and regulations	**Knowledge evidence: Detailed knowledge of: Method used:** **The student should explain how to:** •Identify electrical hazard. •Handle electrical hazards •Use safety gears •React correctly and safely when faced with emergency. **Principles:** The student should explain the principles of: •Handling electrical hazards •Identifying hazard	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available: -** • Tool kit • Workshop rules and regulations guidelines • Service manual • Personal Protective Equipment • Computers and internet	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			learning Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			applying emergency equipment and supplies and reporting to the superior	•Handle safely electrical equipment •Observe safety precaution		materials **Theories:** The student should explain: - •Effects of electrical hazards. **Circumstantial knowledge** **Detailed knowledge about:** •Safety precautions while handling electrical hazards •Safe handling of tools, equipment and machines •Proper waste disposal	connectivity	
		(e) Maintaining safety gears	**Discussions:** Guide the student to discuss how to: maintaining safety gears **Demonstrations** Demonstrate to the students on maintaining safety gears **Hands on activity**	**The student should be able to:** •Use service manual •Identify and apply all emergency equipment and supplies •Make periodic inspection of workshop area and equipment •Observe safety precaution	Safety gears maintained as per safety rules and regulations	**Knowledge evidence:** **Detailed knowledge of: Method used:** **The student should explain how to:** Maintaining safety gears **Principles:** The student should explain the principles of: maintaining safety gears **Theories:** The student	**This element can be achieved at a work place or in a training institution.** **The following tools, equipment and safety gears are to be available: -** • Tool k • Workshop rules and regulations /guidelines • Service manual	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			learning Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			Organise the students to Maintain safety gears by cleaning tools, equipment and workplace	•Clean tools, equipment and workplace •Store tools and equipment		should explain: - the meaning of safety gears. **Circumstantial knowledge** **Detailed knowledge about:** •Safety precautions while handling safety gears •Safe handling of tools, equipment and machines •Proper waste disposal	• Personal Protective Equipment	
	1.3 Handling fire accidents	(a) Handling firefighting equipment and materials	**Discussions:** Guide the student to discuss types and common classes of fire, how to identifying different type of fire extinguishers and handle firefighting equipment and materials **Demonstrations** Invite guest professional to	**The student should be able to:** •Select tools, equipment and safety gears •Identify common classes of fire •Handle different types of fire •Check and test fire extinguishers •Observe safety precaution •Store firefighting,	Fire fighiting maintained as per safety rules and regulations	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to: • Handle firefighting equipment and materials • Apply the right type of fire extinguishers • Apply right type of firefighting	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available: -** • Firefighting rules and regulations • Workshop rules and regulations • Fire extinguishers	78

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			learning Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			demonstrate to the students on handling firefighting equipment and materials **Hands on activity** Organise the students to Handle firefighting equipment and material by Storing firefighting, materials equipment and safety gears correctly	materials equipment and safety gears correctly		materials **Principles:** The student should explain the principles of: • Identifying different type of fire extinguishers • Checking and testing fire extinguishers • Applying right class of fire extinguishers **Theories:** The student should explain: - • Types and common classes of fire • Handle different types of fire • Importance of checking and servicing fire extinguishers • Importance of differentiate firefighting materials **Circumstantial knowledge** **Detailed knowledge about:**	• Firefighting materials • First aid kit • Gloves • Safety boots • Overall • Guest professional • Safety clear glasses	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			learning Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
						• Safety precautions while handling fire accidents • Safe handling of tools and equipment • Waste disposal methods		
		(b) Handling different types of fire	**Discussions:** Guide the student to discuss how to: Identify and handle different type of fire **Demonstrations** Invite a guest professional to demonstrate to the students on Identifying and handling and different type of fire **Hands on activity** Organise the students to Handle different type of	**The student should be able to:** •Select tools, equipment and safety gears •Identify common classes of fire •React correctly and safely when faced with different types of fire •Apply right class of fire extinguisher •Handle different types of fire •Apply right class of firefighting materials •Observe safety precaution	different types of fire handled as per safety rules and regulations	**Knowledge evidence: Detailed knowledge of:** **Method used:** The student should explain how to: Handling different types of fire **Principles:** The student should explain the principles of: • Identifying different type of fire extinguishers • Applying right class of fire extinguishers **Theories:** The student should explain: - • Handling different types of	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available: -** • Firefighting rules and regulations • Workshop rules and regulations • Fire extinguishers • Firefighting material • Gloves • Safety boots • Overall	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			learning Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			fire by applying the right class of fire extinguisher			fire • Importance of checking and servicing fire extinguishers **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while handling fire accidents	• Guest professional • Safety clear glasses	
	1.4 Performing first aid	(a) Performing artificial respiration	**Discussions:** Guide the student to discuss: Importance of first aid and how to perform artificial respiration **Interactive simulation and animation** Guide the student through interactive simulation and animation to visualise performance of performing	**The student should be able to**: •Perform artificial respiration •Sterilize first aid tools •Observe safety precautions. •Store first aid kit	Artificial respiration performed as per safety rules and regulations	**Underpinning knowledge assessment** **Knowledge evidence:** **Detailed knowledge of:** **Method used**: The student should explain how to. Performing artificial respiration **Theories:** The student should explain: - •Types of artificial respiration. •Importance of first aid. **Circumstantial**	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available: -** • First aid Kit. • Stretcher. • Light blanket. • Sterilizer. • Towel • Overall. • Safety boots • Internet connectivity	80

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			learning Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			artificial respiration			**knowledge** Detailed knowledge about: •Safety precautions to be observed while performing artificial respiration. •Safe handling of first aid kit	• Medical gloves.	
		(b) Performing first aid to minor wound scalpels	**Discussions:** Guide the student to discuss on different types of wounds and perform first aid to minor wound scalpels Safety boots **Interactive simulation and animation** Guide the student through interactive simulation and animation to visualise how to performing first aid to minor wound scalpels **Demonstrations** Demonstrate to the	**The student should be able to**: •Select tools and equipment •Identify types of injuries •Attend minor wounds. •Sterilize first aid tools. •Observe safety precautions •Store first aid kit.	first aid to minor wound scalpels performed as per safety rules and regulations	**Underpinning Knowledge Assessment** **Knowledge evidence: Detailed knowledge of:** **Method used**: The student should explain how to perform first aid. Principles: The student should explain principles of: Performing artificial respiration. **Theories:** The student should explain: - •Different types of wounds. •The use of accessories in a first aid kit.	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available: -** : - • First aid Kit. • Stretcher. • Light blanket. • Sterilizer. • Towel • Overall. • Medical gloves. • Internet connectivity • Safety boots	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			learning Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			students on Performing first aid to minor wound scalpels **Hands on activity** Organise the students to write steps of performing first aid to minor wound scalpels			•Importance of first aid. **Circumstantial knowledge** Detailed knowledge about: •Safety precautions to be observed while performing first aid to minor wound scapples. •Safe handling of first aid kit. •Proper Waste disposal		
2.0 Performing preventive maintenance of tools, machines and equipment	2.1 Conducting preventive maintenance of work tools	(a) Maintaining measuring tools	**Discussions:** Guide the student to discuss how to maintain measuring tools **Demonstrations** Demonstrate to the students on maintaining measuring tools **Hands on activity** Organise the students to maintain	**The student should be able to:** •Select tools, equipment and materials •Check functionality basic tools •Identify fault tools •Perform lubrication •Observe safety •Clean tools, equipment and work place •Store tools	measuring tools maintained as per appropriate rules and regulations	**Knowledge evidence: Detailed knowledge of:** **Method used:** The student should explain how to: Maintain measuring tools **Principles:** The student should explain the principles of: • Maintaining measuring tools • Storing measuring tools **Theories:** The student should explain: - • Importance of	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available: -** • Basic tools • Oil can • Service manual • Preventive maintenance schedule • Gloves • Safety boot • Safety clear	120

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			learning Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			measuring tools by identify fault tools.			maintaining measuring tools **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while Maintaining measuring tools • Safe handling of measuring tools	glasses Air compressor	
		(b) Maintaining general hand tools	**Discussions:** Guide the student to discuss importance of maintaining general hand tools and how: to maintain general hand tools **Demonstrations** Demonstrate to the students on maintaining general hand tools **Hands on activity** Organise the students to maintain general	**The student should be able to:** •Use service manual •Interpret service manuals for different tools •Select tools, equipment and materials •Check functionality basic tools •Identify fault tools •Perform lubrication •Observe safety •Clean tools, equipment and	General hand tools maintained as per appropriate rules and regulations	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to: Maintain general hand tools **Principles:** The student should explain the principles of: Maintaining Stores general hand tools **Theories:** The student should explain: - • Importance of maintaining general hand	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available: -** • Basic tools • Oil can • Service manual • Preventive maintenance schedule • Gloves • Safety boot • Safety clear glasses	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			learning Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			hand tools by identify fault tools	work place •Store tools		tools **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while handling general hand tools • Safe handling of general hand tools	Air compressor	
		(c)Maintaining engine and engine accessory tools	**Discussions:** Guide the student to discuss how: to Maintain engine and engine accessory tools **Demonstrations** Demonstrate to the students on Maintaining engine and engine accessory tools **Hands on activity** Organise the students to maintain engine	**The student should be able to**: •Interpret service manuals for different tools •Select tools, equipment and materials •Check functionality basic tools •Identify fault tools •Perform lubrication •Observe safety •Clean tools, equipment and work place	Engine and engine accessory tools maintained as per manufacturer specification	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to: • Maintain engine and engine accessory tools • maintain general hand tools **Principles:** The student should explain the principles of: • Maintaining engine and engine accessory tools.	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available: -** - • Basic tools • Oil can • Service manual • Preventive maintenance schedule • Gloves • Safety boot • Safety clear	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			learning Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			and engine accessory tools by identify fault tools	•Store tools		**Theories:** The student should explain: - Importance of Maintain engine and engine accessory tools **Circumstantial knowledge** **Detailed knowledge about:** Safety precautions while Maintain engine and engine accessory tools. Safe maintaining of engine and engine accessory tools	glasses Air compressor	
		(d) Maintaining tire, wheel, hub, and brake tools	**Discussions:** Guide the student to discuss how: to Maintain tire, wheel, hub, and brake tools **Demonstrations** Demonstrate to the students on Maintaining tire, wheel, hub, and brake tools **Hands on activity**	**The student should be able to:** •Interpret service manuals for different tools •Select tools, equipment and materials •Check functionality basic tools •Identify fault tools •Perform	Tire, wheel, hub, and brake tools maintained as per manufacturer specification	**Knowledge evidence: Detailed knowledge of:** **Method used:** The student should explain how to: Maintain tire, wheel, hub, and brake tools **Principles:** The student should explain the principles of: Maintaining tire, wheel, hub, and brake	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available: -** • Basic tools • Oil can • Service manual • Preventive maintenance	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			learning Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			Organise the students to maintain tire, wheel, hub, and brake tools by identify fault tools	lubrication •Observe safety •Clean tools, equipment and work place •Store tools		tools. **Theories:** The student should explain: - Importance of Maintain tire, wheel, hub, and brake tools**.** **Circumstantial knowledge** **Detailed knowledge about:** Safety precautions while Maintaining tire, wheel, hub, and brake tools	schedule • Gloves • Safety boot • Safety clear glasses Air compressor	
		(e) Maintaining electrical circuit and light system	**Discussions:** Guide the student to discuss how: to Maintain electrical circuit and light system **Demonstrations** Demonstrate to the students on Maintaining electrical circuit and light system. **Hands on activity** Organise the students to	**The student should be able to:** •Interpret service manuals for different tools •Select tools, equipment and materials •Check functionality basic tools •Identify fault tools •Observe safety •Clean tools, equipment and	Electrical circuit and light system maintained as per manufacturer specification	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to: Maintain electrical circuit and light system **Principles:** The student should explain the principles of: Maintaining electrical circuit and light system **Theories:** The student	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available: -** • Basic tools • Oil can • Service manual • Preventive maintenance schedule • Gloves	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			learning Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			Maintaining electrical circuit and light system by identify fault tools	work place •Store tools		should explain: - Importance of Maintaining electrical circuit and light system **Circumstantial knowledge** **Detailed knowledge about:** Safety precautions while maintaining electrical circuit and light system	• Safety boot • Safety clear glasses Air compressor	
	2.2 Conducting preventive maintenance of workshop machines	(a) Maintaining power machines.	**Discussions:** Guide the student to discuss how: to Maintain power machines **Demonstrations** Demonstrate to the students on Maintaining power machines **Hands on activity** Organise the students to Maintain power	**The student should be able to:** •Interpret machine manual •Prepare maintenance schedule •Detect machine faults •Lubricate machine •Sharpen cutting tools. •Clean working place •Dusting off	Power machines. maintained as per manufacturer specification	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain different ways of maintaining power machines **Principles:** The student should explain the principle of performing maintenance to machines **Theories:** The student should explain:	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available: -** • Powered machine • Grease • Kerosene • Waste cotton • Tool kit • Pneumatic machine	121

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			learning Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			machines system by interpreting machine manual and detecting faults	machines		• Parts of machines and their maintenance • Types of maintenance in each machine part. **Circumstantial knowledge** **Detailed knowledge about:** • Safety aspect related to machine maintenance. • Environmental issues	• Hydraulic machine	
		(b) Maintaining manual machines.	**Discussions:** Guide the student to discuss how: to Maintain manual machines **Demonstrations** Demonstrate to the students on Maintaining manual machines **Hands on activity** Organise the students to Maintain manual	**The student should be able to:** •Interpret machine manual •Prepare maintenance schedule •Detect machine faults • lubricate machine •Sharpen cutting tools •Clean working place •Dusting off machines	Manual machines maintained as per manufacturer specification	**Knowledge evidence: Detailed knowledge of:** **Method used:** The student should explain different ways of maintaining manual machine **Principles:** The student should explain the principle of performing maintenance to manual machines **Theories:** The student should explain:	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available: -** • Manual machines • Lubricant • Kerosene • Waste cotton • Tool kit • Pneumatic	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			learning Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			machines by interpreting machine manual and detecting faults			• Types of maintenance in each machine part. • The role of lubricants in machines **Circumstantial knowledge** **Detailed knowledge about:** Safety aspect related to manual machine maintenance	machine • Hydraulic machine	
3.0 Building simple electric circuits	3.1 Constructing simple electric circuits	(a) Constructing simple series circuit	**Discussions:** Guide the student to discuss Ohm's law and how to Construct simple series circuit **Demonstrations** Demonstrate to the students on Constructing simple series circuit **Hands on activity** Organise the students to Construct simple	**The student should be able to:** •Select appropriate tools •Observe safety precautions •Observe procedures for constructing simple series circuits •Constructing simple series circuits •Perform soldering. •Observe safety precautions. •Clean tools, equipment and work place.	Simple series circuit Constructed as per diagram provided	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to: Construct simple series circuit **Principles:** The student should explain the principles of: Constructing simple series circuit **Theories:** The student should explain: • Ohm's law. • Types of electric circuit connections. • Measurement of	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available: -** • Electrical material • Safety boots • Safety glasses • Safety gloves • Tool kits • Work bench. • Electric board • Measuring tape. • Analogue and digital	98

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			learning Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			series circuit according to the given circuit diagram	•Store tools and equipment.		voltage in the circuit. • Measurement of current in the circuit. • Measurement of resistance in the circuit Verification of electric rules and laws. • Importance of component ratings. • Types and uses of measuring equipment. • Application of colour codes. **Circumstantial knowledge:** **Detailed knowledge about:** Safe handling of work tools. Safe handling of measuring instruments.	multimeters. Wire brush	
		(b) Constructing simple parallel circuit	**Discussions:** Guide the student to discuss on	**The student should be able to:** •Select appropriate	Simple parallel circuit Constructed as	**Knowledge evidence:** **Detailed knowledge of:**	**This element can be achieved at a work place or in a**	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			learning Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			how to Construct simple parallel circuit **Demonstrations** Demonstrate to the students on Constructing simple parallel circuit **Hands on activity** Organise the students to Construct simple parallel circuit according to the given circuit diagram	tools •Observe safety precautions •Determine component values •Constructing simple parallel circuits •Perform soldering. •Observe safety precautions. •Clean tools, equipment and work place •Store tools and equipment	per diagram provided	**Method used:** The student should explain how to: Construct simple parallel circuit **Principles:** The student should explain the principles of: Constructing simple parallel circuit **Theories:** The student should explain: explain on how to Construct simple parallel circuit **Circumstantial knowledge:** **Detailed knowledge about:** Safe handling of work tools. Safe handling of measuring instruments	**training institution. The following tools, equipment and safety gears are to be available: -** • Set of different wire connectors • Test lamp • Safety boots • Safety glasses • Safety gloves • Tool kits • Work bench • Electric board • Measuring tape • Analogue and digital multimeters	
		(c) Constructing simple combination circuit.	**Discussions:** Guide the student to discuss how to Construct simple combination circuit	**The student should be able to:** •Select appropriate tools •Determine component values. •Construct simple	Simple combination circuit. constructed as per diagram provided	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to: Construct simple	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to**	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			learning Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			Demonstrations Demonstrate to the students on Constructing simple combination circuit **Hands on activity** Organise the students to Construct simple combination circuit according to the given circuit diagram	combination circuits. •Perform soldering. •Measure electric quantities •Observe safety precautions. •Clean tools, equipment and work place. •Store tools and equipment		combination circuit **Principles:** The student should explain the principles of: Constructing simple combination circuit **Theories:** The student should explain: Different component ratings. **Circumstantial knowledge:** **Detailed knowledge about:** Safe handling of work tools. Safe handling of measuring instruments.	**be available: -** • Set of different wire connectors. • Test lamp. • Safety boots • Safety glasses • Safety gloves • Helmet • Reflective vest • Tool kits • Work bench. • Electric board • Measuring tape. • Analogue and digital multimeters	
	3.2 Measuring electric quantities	(a) Measuring voltage in the circuit	**Discussions:** Guide the student to discuss different component ratings and how to Measure voltage in the circuit **simulation and animation** Guide the student	**The student should be able to:** Determine component values •Measuring voltage in the circuit. •Observe safety precautions •Clean tools,	Circuit voltage measured as per provided procedure	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to: Measure voltage in the circuit **Principles:** The student should explain the principles of: Measuring voltage in	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available: -** • Electrical components • Analog and digital	97

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			learning Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			through interactive simulation and animation to visualise measuring electrical voltage in the circuit **Demonstrations** Demonstrate to the students on Measuring voltage in the circuit **Hands on activity** Organise the students to Measure voltage in the circuit as per provided procedure	equipment and work place. •Store tools and equipment		the circuit **Theories:** The student should explain: Measurement of voltage in the circuit and different component ratings **Circumstantial knowledge:** **Detailed knowledge about:** Safe handling of work tools. Safe handling of measuring instruments	Multimeters • Internet connection • Tool kit. • Work bench. • Work bench light • Power supply. • Safety boots. • Safety gloves. Overall	
		(b) Measuring current in the circuit	**Discussions:** Guide the student to discuss on different component ratings and how to Measure current in the circuit	**The student should be able to:** Measure current in the circuit. •Observe safety precautions. •Clean tools, equipment and work place •Store tools and	Circuit current measured as per provided procedure	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to: Measure current in the circuit **Principles:** The student should explain the principles of:	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available: -** • Electrical components	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			learning Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			simulation and animation Guide the student through interactive simulation and animation to visualise measuring electrical current in the circuit **Demonstrations** Demonstrate to the students on Measuring current in the circuit **Hands on activity** Organise the students to Measure current in the circuit as per provided procedure	equipment		Measuring current in the circuit **Theories:** The student should explain: • Different component ratings • Measurement of current in the circuit **Circumstantial knowledge:** **Detailed knowledge about:** Safe handling of work tools. Safe handling of measuring instruments	• Analog and digital Multimeters • Internet connection • Tool kit • Work bench. • Work bench light • Power supply • Safety boots • Safety gloves Overall	
		(c) Measuring resistance in the circuit.	**Discussions:** Guide the student to discuss how to Measure resistance in the circuit **simulation and**	**The student should be able to:** Measuring resistance in the circuit •Observe safety	Circuit resistance measured as per provided procedure	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to: Measure resistance in	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to**	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			learning Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			animation Guide the student through interactive simulation and animation to visualise measuring resistance in the circuit **Demonstrations** Demonstrate to the students on Measuring resistance in the circuit **Hands on activity** Organise the students to Measure resistance in the circuit as per provided procedure	precautions •Clean tools, equipment and work place. •Store tools and equipment		the circuit **Principles:** The student should explain the principles of: Measuring resistance in the circuit **Theories:** The student should explain: • Ohm's law • Different component ratings • Measurement of resistance in the circuit **Circumstantial knowledge:** **Detailed knowledge about:** Safe handling of work tools. Safe handling of measuring instruments.	**be available: -** • Electrical components • Analog and digital Multimeters • Tool kit • Internet connection • Work bench. • Work bench light • Power supply • Safety boots. • Safety gloves • Overall	
		(d) Measuring electrical power in the circuit	**Discussions:** Guide the student to discuss how to Measure electrical power in the circuit	**The student should be able to:** Measuring electrical power in the circuit. •Observe safety	Electrical power in the circuit. measured as per provided procedure	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to: Measure electrical	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to**	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			learning Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			simulation and animation Guide the student through interactive simulation and animation to visualise measuring electrical power in the circuit **Demonstrations** Demonstrate to the students on Measuring electrical power in the circuit **Hands on activity** Organise the students to Measure electrical power in the circuit as per provided procedure	precautions. •Clean tools, equipment and work place. •Store tools and equipment		power in the circuit. **Principles:** The student should explain the principles of: measuring electrical power in the circuit **Theories:** The student should explain: • Ohm's law • Different component ratings. • Measurement of electrical power in the circuit **Circumstantial knowledge:** **Detailed knowledge about:** Safe handling of work tools. Safe handling of measuring instruments.	**be available: -** • Electrical components • Analog and digital Multimeters. • Tool kit • Work bench. • Work bench light. • Internet connection • Power supply • Safety boots. • Safety gloves • Overall	
4.0 Performing bench work	4.1. Performing cutting	(a) Performing straight sawing	**Discussions:** Guide the student to discuss how to Perform straight sawing	**The student should be able to:** •Interpret drawings •Select tools and equipment	Straight sawing performed as per provided worksheet	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain	**This element can be achieved at a work place or in a training institution. The following tools,**	92

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			learning Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			simulation and animation Guide the student through interactive simulation and animation to visualise straight sawing **Demonstrations** Demonstrate to the students on Performing straight sawing **Hands on activity** Organise the students to Perform straight sawing as work sheet	•Take measurements •Cut work piece. •Check for accuracy •Observe safety precautions •Clean tools, work piece and work place. •Store tools, equipment and workplace		how to perform straight sawing **Principles:** The student should explain the principles of: Performing straight sawing **Theories:** The student should explain: • Different types of materials and their properties • Application of different materials • Uses of cutting tools and equipment. **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while performing straight sawing process. • Safe handling of work tools and	**equipment and safety gears are to be available: -** • Work bench • Steel rule • Scriber • T-Square • Vernier calliper • Divider • Surface table/plate • Internet connection • Chisels • Hand shear • Centre punch • Hacksaw • Power hacksaw Safety clear glasses. • Gloves. • Safety boots • Overall	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			learning Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
						equipment		
		(b) Performing angular sawing.	**Discussions:** Guide the student to discuss how to Perform angular sawing **simulation and animation** Guide the student through interactive simulation and animation to visualise performing angular sawing **Demonstrations** Demonstrate to the students on Performing angular sawing **Hands on activity** Organise the students to Perform angular sawing as per provided worksheet	**The student should be able to:** •Interpret drawings. •Select tools and equipment. •Take measurements. •Cut work piece. •Check for accuracy. •Observe safety precautions. •Clean tools, work piece and work place. •Store tools, equipment and workplace.	Angular sawing performed as per provided worksheet	**Knowledge evidence: Detailed knowledge of:** **Method used:** The student should explain how: perform angular sawing **Principles:** The student should explain the principles of: Performing angular sawing **Theories:** The student should explain: • Application of different materials • Uses of cutting tools and equipment **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while performing	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available: -** • Work bench. • Steel rule • Scriber • T-Square. • Vernier calliper • Divider • Internet connection • Surface table/plate. • Chisels • Hand shear • Centre punch. • Hacksaw • Power hacksaw • Safety clear glasses • Gloves • Safety boots • Overall	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			learning Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
						angular sawing process. • Safe handling of work tools and equipment Proper waste disposal		
		(c) Performing chiselling	**Discussions:** Guide the student to discuss how to perform chiselling **simulation and animation** Guide the student through interactive simulation and animation to visualise performing chiselling. **Demonstrations** Demonstrate to the students on Performing chiselling **Hands on activity** Organise the	**The student should be able to:** •Interpret drawings. •Select tools and equipment •Take measurements •Cut work piece •Check for accuracy •Observe safety precautions •Clean tools, work piece and work place •Store tools, equipment and workplace	chiselling performed as per provided worksheet	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how: perform angular sawing **Principles:** The student should explain the principles of: Performing chiselling **Theories:** The student should explain: Uses of chiselling tools and equipment **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while performing chiselling process • Safe handling of	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available: -** • Work bench • Steel rule • Scriber • T-Square • Vernier caliper • Divider • Internet connection • Surface table/plate • Ball pen hammer • Anvil • Chisels • Hand shear • Shearing	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			learning Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			students to Perform chiselling as per provided worksheet			work tools and equipment • Waste disposal	machine • Centre punch. • Hacksaw • Power hacksaw • Safety clear glasses • Gloves • Safety boots Overall	
	4.2 Performing filing	(a) Performing flat filing	**Discussions:** Guide the student to discuss how to Perform flat filing **Demonstrations** Demonstrate to the students on Performing flat filing **Hands on activity** Organise the students to Perform flat filing as per provided worksheet	**The student should be able to**: •Interpret drawings. •Select tools. •Take measurements and marking. •perform flat Filing on work piece. •Check for accuracy •Observe safety precautions •Clean tools, work piece and work place. •Store tools, equipment and work piece	Flat filing performed as per provided worksheet	**Knowledge evidence: Detailed knowledge of:** **Method used:** The student should explain how: perform flat filing **Principles:** The student should explain the principles of: • Performing flat filling • Marking work piece. • Flat filling process **Theories:** The student should explain: Uses of flat filling tools and equipment **Circumstantial**	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available: -** • Work bench. • Set of files • File card • Try square • Steel rule • Centre punch • Scriber • Divider • Overall • Gloves • Safety clear glasses • Safety boots	92

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			learning Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
						knowledge **Detailed knowledge about:** • Safety precautions while performing flat filling process • Safe handling of work tools and equipment • Waste disposal		
		(b) Performing radii filing.	**Discussions:** Guide the student to discuss how: to Perform radii filing **simulation and animation** Guide the student through interactive simulation and animation to visualise performing radii filling **Demonstrations** Demonstrate to the students on Performing radii	**The student should be able to:** •Interpret drawings. •Select tools. •Take measurements and marking. •perform radii Filing on work piece •Check for accuracy •Observe safety precautions •Clean tools, work piece and work place •Store tools, equipment and work piece	Radii filing performed as per provided worksheet	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how: perform radii filing **Principles:** The student should explain the principles of: • Performing radii filling • Marking work piece. • radii filling process **Theories:** The student should explain: Uses of flat filling tools and equipment	**This element can be achieved at a work place or in a training institution.** **The following tools, equipment and safety gears are to be available: -** • Work bench • Set of files. • File card • Try square • Steel rule • Centre punch. • Scriber. • Divider • Overall • Gloves • Internet	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			learning Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			filing **Hands on activity** Organise the students to Perform radii filing as per provided worksheet			**Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while performing radii filling process. • Safe handling of work tools and equipment	connection • Safety clear glasses • Safety boots	
		(c) Performing angle filing.	**Discussions:** Guide the student to discuss how: to Perform angle filing **simulation and animation** Guide the student through interactive simulation and animation to visualise performing angle filling **Demonstrations** Demonstrate to the students on	**The student should be able to:** •Interpret drawings. •Select tools •Take measurements and marking •perform angle filing on work piece •Check for accuracy •Observe safety precautions. •Clean tools, work piece and work place •Store tools, equipment and work piece	Angle filing performed as per provided worksheet	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how: perform angle filing **Principles:** The student should explain the principles of: • Performing angle filling • angle filling process. **Theories:** The student should explain: Uses of angle filling tools and equipment	**This element can be achieved at a work place or in a training institution.** **The following tools, equipment and safety gears are to be available: -** • Work bench • Set of files • File card • Try square • Steel rule • Centre punch • Scriber • Divider • Overall • Gloves	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			learning Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			Performing angle filing. **Hands on activity** Organise the students to Perform angle filing as per provided worksheet			**Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while performing angle filling process. Safe handling of work tools and equipment	• Internet connection • Safety clear glasses • Safety boots.	
	4.3 Performing drilling	(a) Performing hand drilling on plate	**Discussions:** Guide the student to discuss how: to Perform hand drilling on plate. **Demonstrations** Demonstrate to the students on Performing hand drilling on plate. **Hands on activity** Organise the students to Perform hand drilling on plate as per provided	**The student should be able to:** •Interpret drawings. •Select tools, equipment and materials •Mark work piece. •Drill holes •Observe safety precautions •Clean tools, equipment, work piece and work place •Store tools, equipment and work piece	Hand drilling on plate performed as per provided worksheet	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to: Perform hand drilling on plate process **Principles:** The student should explain the principles of: Performing hand drilling on plate Selection **Theories:** The student	**This element can be achieved at a work place or in a training institution.** **The following tools, equipment and safety gears are to be available: -** • Work bench. • Hand drilling machine • plate • Centre punch • Scriber • Steel rule • Try square • Set of drill bits	92

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			learning Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			worksheet			should explain: hand drilling on plate procedures **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while performing the task. • Safe handling of drilling tools and equipment. Proper waste disposal	• Hacksaw • Wire brush • coolant • Vernier caliper • Safety clear glasses • Gloves • Safety boots • Overalls	
		(b) Carrying out drilling on bench drilling machine.	**Discussions:** Guide the student to discuss how to Carry out drilling on bench drilling machine **Demonstrations** Demonstrate to the students on Carrying out drilling on bench drilling machine **Hands on activity** Organise the	**The student should be able to:** •Interpret drawings. •Select tools, equipment and materials •Mark work piece. •Drill holes •Observe safety precautions •Clean tools, equipment, work piece and work place •Store tools,	Drilling on bench drilling machine carried out as per provided worksheet	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to: Carry out drilling on bench drilling machine **Principles:** The student should explain the principles of: Carrying out drilling on bench drilling machine	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available: -** • Work bench • Centre punch • Scriber • Steel rule. • Try square • Set of drill bits. • Bench drilling	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			learning Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			students to Carry out drilling on bench drilling machine as per provided worksheet	equipment and work piece		**Theories:** The student should explain: Carrying out drilling on bench drilling machine **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while performing the task. • Safe handling of drilling tools and equipment. Proper waste disposal	machine and accessories • Coolant • Vernier caliper • Safety clear glasses • Gloves • Safety boots • Overalls	
		(c) Counter boring drilled holes	**Discussions:** Guide the student to discuss how to Carry out counter boring drilled holes **simulation and animation** Guide the student through interactive simulation and animation to visualise	**The student should be able to:** •Interpret drawings. •Select tools, equipment and materials •Drill holes. •Perform counter boring of a drilled hole •Observe safety precautions. •Clean tools, equipment, work	Drilled holes. Counter boring Carried out as per provided worksheet	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to: Carry out counter boring drilled holes. **Principles:** The student should explain the principles of: Carrying out Counter boring drilled holes	**This element can be achieved at a work place or in a training institution.** **The following tools, equipment and safety gears are to be available: -** • Work bench. • Internet connection • Hand drilling machine • Centre punch	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			learning Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			performing counter boring **Demonstrations** Demonstrate to the students on Carry out counter boring drilled holes **Hands on activity** Organise the students to Carry out counter boring drilled holes as per provided worksheet	piece and work place •Store tools, equipment and work piece		**Theories:** The student should explain: Carrying out Counter boring drilled holes Purpose of **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while performing the task • Safe handling of drilling tools and equipment • Proper waste disposal	• Scriber • Steel rule • Try square • Set of drill bits • Bench drilling machine and accessories • Coolant • Vernier caliper • Calculator • Reamers • Safety clear glasses • Gloves • Safety boots • Overalls	
	4.4 Performing riveting	(a) Performing manual riveting	**Discussions:** Guide the student to discuss how to Perform manual riveting and application of different materials in riveting **Demonstrations** Demonstrate to the students on	**The student should be able to:** •Interpret drawings. •Select tools, equipment and materials •Mark work piece. •Perform manual riveting •Observe safety precautions. •Clean tools,	Manual riveting performed as per provided worksheet	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to: Perform manual riveting.. **Principles:** The student should explain the principles of: • Marking work	**This element can be achieved at a work place or in a training institution.** **The following tools, equipment and safety gears are to be available: -** • Riveting accessories • Steel rule • Centre punch	93

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			learning Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			performing manual riveting **Hands on activity** Organise the students to Perform manual riveting as per provided worksheet	equipment, work piece and work place •Store tools, equipment and work piece		piece • Manual riveting pieces of metals. **Theories:** The student should explain: • Types of rivets. • Application of different materials in riveting **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while performing the task. • Safe handling of work tools, equipment and work pieces. Waste disposal	• Set of drill bits • Divider • Soft hammer • Ball pein hammer • Rivert head forming tools • Anvil • Work bench • Pliers • Goggles • Gloves • Safety boot Overall	
		(b) Performing pop riveting	**Discussions:** Guide the student to discuss how: to Perform pop riveting **Interactive**	**The student should be able to:** •Interpret drawings •Select tools, equipment and materials •Mark work piece	Pop riveting. performed as per worksheet instruction	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to: Perform pop riveting	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to**	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			learning Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			simulation and animation Guide the student through interactive simulation and animation to visualise performing pop riveting **Demonstrations** Demonstrate to the students on Performing pop riveting **Hands on activity** Organise the students to Perform pop riveting as per worksheet instruction	•Perform pop riveting •Observe safety precautions •Clean tools, equipment, work piece and work place •Store tools, equipment and work piece		**Principles:** The student should explain the principles of: Performing pop riveting. **Theories:** The student should explain: • Types of rivets. • Application of different materials in riveting **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while performing the task. • Safe handling of work tools, equipment and work pieces. Waste disposal	**be available: -** • Riveting machine and accessories • Internet connection • Steel rule. • T-Square. • Centre punch • Drilling machine. • Set of drill bits • Rivet gun • Divider • Shearing machine • Rivert head forming tools • Work bench Pliers • Goggles • Gloves • Safety boot • Overall	
		(c) Performing pneumatic riveting	**Discussions:** Guide the student to discuss how to Perform pneumatic riveting	**The student should be able to:** •Interpret drawings •Select tools, equipment and materials.	Pneumatic riveting performed as per worksheet instruction	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to:	**This element can be achieved at a work place or in a training institution. The following tools, equipment and**	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			learning Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			Demonstrations Demonstrate to the students on Performing pneumatic riveting **Hands on activity** Organise the students to Perform pneumatic riveting as per worksheet instruction	•Mark work piece •Perform pneumatic riveting. •Observe safety precautions. •Clean tools, equipment, work piece and work place •Store tools, equipment and work piece		Perform pneumatic riveting **Principles:** The student should explain the principles of: Perform pneumatic riveting **Theories:** The student should explain: • Types of rivets • Application of different materials in riveting **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while performing the task • Safe handling of work tools, equipment and work pieces • Proper waste disposal	**safety gears are to be available: -** • Riveting machine and accessories • Steel rule • Wire brush • Pneumatic riveting tool • T-Square • Centre punch. • Drilling machine • Set of drill bits • Rivet gun • Divider • Rivet head forming tool • Work bench. • Goggles • Gloves • Safety boot • Overall	
	4.5 Performing threading	(a) Carrying out thread cutting	**Discussions:** Guide the student	**The student should be able to:**	Thread cutting using die carried	**Knowledge evidence: Detailed knowledge**	**This element can be achieved at a work**	95

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			learning Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
		using die	to discuss how: to Carry out thread cutting using die **Interactive simulation and animation** Guide the student through interactive simulation and animation to visualise performance of using die **Demonstrations** Demonstrate to the students on Carrying out thread cutting using die **Hands on activity** Organise the students to Carry out thread cutting using die as per worksheet instruction	•Interpret drawings. •Select tools, equipment and materials •Cut threads using die •Observe safety precautions •Clean tools, equipment, work piece and work place •Store tools, equipment and work piece	out as per worksheet instructions.	**of:** **Method used:** The student should explain how to: • Carry out thread cutting using die **Principles:** The student should explain the principles of: Carrying out thread cutting using die. **Theories:** The student should explain: • Types of dies. • Thread classifications **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while cutting threads • Safe handling of tools, equipment and materials Waste disposal	**place or in a training institution** **The following tools, equipment and safety gears are to be available: -** • Set of die and stock wrenches • Set of dies and stock wrenches • Work bench • Wire brush • Internet connection • Coolant • Scriber • Steel rule. • Thread gauges • Vernier caliper. • File. • Centre drill • Centre punch • Thread data manual • Gloves. • Goggles • Safety boots • Overalls	
		(b) Carrying out	**Discussions:**	**The student should**	Thread cutting	**Knowledge evidence:**	**This element can be**	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			learning Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
		taping.	Guide the student to discuss how: to Carry out taping **Interactive simulation and animation** Guide the student through interactive simulation and animation to visualise performance of tapping **Demonstrations** Demonstrate to the students on Carrying out taping **Hands on activity** Organise the students to Carry out taping as per worksheet instruction	**be able to:** •Interpret drawings. •Select tools, equipment and materials •Drill hole •perform thread cutting using die •Observe safety precautions. •Clean tools, equipment, work piece and work place. •Store tools, equipment and work piece	using tap carried out as per worksheet instructions	**Detailed knowledge of:** **Method used:** The student should explain how to: Carry out taping thread cutting using tap **Principles:** The student should explain the principles of: • Taking measurements • Select thread pitch **Theories:** The student should explain: • The function of taps. • Types of taps • Thread classifications **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while cutting threads • Safe handling of tools, equipment and materials	**achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available: -** • Set of taps and stock wrenches • Internet connection • Set of taps wrenches • Work bench • Wire brush • Set of drill bits • Lubricant • Scriber • Steel rule • Thread gauges • Vernier caliper • File • Centre drill • Centre punch • Thread data manual • Gloves • Goggles • Safety boots • Overalls	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			learning Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
						Proper waste disposal		
	4.6 Performing metal forming	(a) Bending flat materials	**Discussions:** Guide the student to discuss how to bend flat materials **Demonstrations** Demonstrate to the students on bending flat materials **Hands on activity** Organise the students to bend flat materials as per worksheet instruction	**The student should be able to:** •Interpret drawing •Select required work piece •Prepare required tools and equipment for bending •Mark work piece •Clamp work piece on bench vice •Bend flat work piece •Observe safety precautions. •Clean tools, equipment, work pieces and work place. •Store tools, equipment and remained material	Flat materials bent as per worksheet instruction	**Knowledge evidence: Detailed knowledge of:** **Method used:** The student should explain how to: Bend flat materials. in different shapes.. **Principles:** The student should explain the principles of: • Holding work piece. Bending flat materials • Making allowances for joints. **Theories:** The student should explain: • Types of machines and equipment used for metal bending flat materials • Uses of various tools and equipment **Circumstantial knowledge** **Detailed knowledge about:**	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available: -** : • Work bench. • Bench vice • Try square. • Vernier caliper • Hacksaw • Steel rule • Flat materials • Level protractor • Spring divider • Scriber • Anvil • Centre punch • Hammer • Radius gauges • Bending machine • Leather gloves • Overall • Safety boots • Safety glasses	93

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			learning Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
						Safety precautions while bending flat materials. • metal • Safe handling of tools and equipment Waste disposal		
		(b) Bending round materials	**Discussions:** Guide the student to discuss how to bend round materials **Interactive simulation and animation** Guide the student through interactive simulation and animation to visualise performance of bending round material **Demonstrations** Demonstrate to the students on Bending round materials	**The student should be able to:** •Interpret drawing •Select required work piece •Prepare required tools and equipment for bending •Mark work piece •Clamp work piece on bench vice •Bend round work piece •Observe safety precautions •Clean tools, equipment, work pieces and work place •Store tools, equipment and remained material	Round materials bent as per worksheet instruction given	**Knowledge evidence: Detailed knowledge of:** **Method used:** The student should explain how to: Bend round materials in different shapes **Principles:** The student should explain the principles of: Bending round materials and making allowances for joints. **Theories:** The student should explain: • Types of machines and equipment used for metal bending of round materials • Uses of various	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available: -** • Work bench • Bench vice • Try square • Vernier calliper • Steel rule • Round materials • Hacksaw • Level protractor • Spring divider • Scriber • Anvil • Centre punch. • Hammer • Radius gauges.	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			learning Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			Hands on activity Organise the students to bend round materials as per worksheet instruction			tools and equipment • How to read scales **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while • Safe handling of tools and equipment • Waste disposal	• Bending machine • Leather gloves • Overall. • Safety boots • Safety glasses	

Form Two

Table 4: *Detailed Contents for Form Two*

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
1. 0 Performing welding processes	1.1 Performing arc welding	(a) Performing down hand arc welding bead	**Discussions:** Guide the student to discuss how to Perform down hand arc welding bead **Interactive simulation and animation** Guide the student through interactive simulation and animation to visualise performance of down hand arc welding bead	**The student should be able to:** •Interpret drawings •Select tools, equipment and materials •Select welding current •Weld work piece •Remove slag •Observe safety precautions •Clean tools, equipment, work piece, and work place. •Store tools and equipment	down hand arc welding bead as per given instruction	**Knowledge evidence: Detailed knowledge of: Method used:** The student should explain how to: Prepare work piece. Performing down hand arc welding bead **Principles:** The student should explain the principles of: Performing down hand arc welding bead **Theories:** The student should explain:	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available:** - • AC/DC arc welding machine • Chipping hammer • Welding bench. • Clamp • Hand hacksaw. • Shearing machine • Wire brush	90

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			Demonstrations Demonstrate to the students on Performing down hand arc welding bead **Hands on activity** Organise the students to Perform down hand arc welding bead			• Performing down hand arc welding bead. • Types of electrodes • Properties of materials. • Application of AC and DC arc welding machines **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while performing arc welding • Safe handling of work tools, equipment and materials • Proper waste disposal	• Scriber • Centre punch. • Steel rule • Internet connectivity • Set of files • Try square • Grinding machine • Anvil • Welding shield. • Leather apron • Tong • Gloves • Safety boots • Overall • Safety clear glasses	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
		(b) Performing down hand V joint	**Discussions:** Guide the student to discuss how to Perform down hand V joint **Interactive simulation and animation** Guide the student through interactive simulation and animation to visualise performance of down hand V joint **Demonstrations** Demonstrate to the students on Performing down hand V joint	**The student should be able to:** •Interpret drawings •Select tools, equipment and materials •Select welding current. •Weld work piece •Remove slag •Observe safety precautions •Clean tools, equipment, work piece, and work place •Store tools and equipment	Down hand V joint as per given instruction	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to: • Perform down hand V joint • **Principles:** The student should explain the principles of: Performing down hand V joint **Theories:** The student should explain: • Types of electrodes. • Application of AC and DC arc welding machines **Circumstantial knowledge**	**This element can be achieved at a work place or in a training institution.** **The following tools, equipment and safety gears are to be available:** - • AC/DC arc welding machine • Chipping hammer • Welding bench. • Clamp • Wire brush. • Scriber • Centre punch • Steel rule • Ball pein hammer • Set of files • Try square • Hand grinding	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			Hands on activity Organise the students to Perform down hand V joint			**Detailed knowledge about:** • Safety precautions while performing arc welding • Safe handling of work tools, equipment and materials Waste disposal	machine • Anvil • Welding shield • Leather apron • Tong • Gloves • Safety boots • Overall Safety clear glasses	
		(c) Performing down hand butt joint	**Discussions:** Guide the student to discuss how to Perform down hand butt joint **Interactive simulation and animation** Guide the student through interactive simulation and animation to	**The student should be able to:** •Interpret drawings •Select tools, equipment and •Select welding current •Weld work piece •Remove slag •Observe safety precautions.	Down hand butt joint as per given instruction	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to: • Prepare work piece • Performing down hand butt joint sizes **Principles:** The student should	**This element can be achieved at a work place or in a training institution.** **The following tools, equipment and safety gears are to be available:** - • AC/DC arc welding machine • Chipping	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			visualise performance of down hand butt joint **Demonstrations** Demonstrate to the students on Performing down hand butt joint **Hands on activity** Organise the students to Perform down hand butt joint	•Clean tools, equipment, work piece, and work place •Store tools and equipment		explain the principles of: • Taking measurements. • Performing down hand butt joint **Theories:** The student should explain: • Types of welding • Types of electrodes • Properties of materials • Application of AC and DC arc welding machines **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while	hammer • Welding bench • Clamp • Wire brush • Scriber • Centre punch • Steel rule • Set of files • Try square • Hand grinding machine • Anvil • Welding shield • Leather apron • Tong • Gloves • Safety boots • Overall • Safety clear glasses	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
						performing arc welding. • Safe handling of work tools, equipment and materials • Waste disposal		
		(d) Performing down hand T joint welding	**Discussions:** Guide the student to discuss how to Perform down hand T joint welding **Interactive simulation and animation** Guide the student through interactive simulation and animation to visualise performance of down hand T	**The student should be able to:** •Interpret drawings •Select tools, equipment and materials •Select welding current •Weld work piece •Remove slag •Observe safety precautions •Clean tools, equipment, work piece, and work place.	Down hand T joint welding as per given instruction	**Knowledge evidence: Detailed knowledge of: Method used:** The student should explain how to: Perform down hand T joint welding **Principles:** The student should explain the principles of: Performing down hand T joint welding **Theories:** The student should	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available: -** • AC/DC arc welding machine • Chipping hammer • Welding bench • Clamp • Shearing machine	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			joint. **Demonstrations** Demonstrate to the students on Performing down hand T joint welding **Hands on activity** Organise the students to Perform down hand T joint welding	•Store tools and equipment		explain: • Types of welding • Types of electrodes • Properties of materials • Application of AC and DC arc welding machines **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while performing arc welding • Safe handling of work tools, equipment and materials • Waste disposal	• Wire brush • Scriber • Centre punch • Steel rule • Set of files • Try square • Hand grinding machine • Anvil • Welding shield • Leather apron • Tong • Gloves • Safety boots. • Overall • Safety clear glasses	
	1.2. Performing gas	(a) Using gas	**Discussions:**	**The student**	gas welding tools	**Knowledge**	**This element can**	90

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
	welding	welding tools and equipment	Guide the student to discuss On Using gas welding tools and equipment **Interactive simulation and animation** Guide the student through interactive simulation and animation to visualise Using gas welding tools and equipment **Demonstrations** Demonstrate to the students on Use gas welding tools and equipment	**should be able to:** •Interpret drawings •Select tools, equipment and materials •Adjust the welding flame. •Observe safety precautions. •Clean tools, equipment, •Store tools and equipment	and equipment used as per manufacturers instruction	**evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to: Use gas welding tools and equipment. **Principles:** The student should explain the principles of: Using gas welding tools and equipment **Theories:** The student should explain: • Types of welding • Types of electrodes • Properties of materials • Application of AC and DC arc welding	**be achieved at a work place or in a training institution.** **The following tools, equipment and safety gears are to be available:** - • Oxy-acetylene gas cylinders and accessories • Pair of tongs • Wire brush • Oxy-acetylene welding bench • Oxy-acetylene welding bay • Clamp • Scriber • Steel rule • Cylinder trolley • Safety boots • Overall • Gloves • Leather apron	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			Hands on activity Organise the students to Using gas welding tools and equipment			machines **Circumstantial knowledge Detailed knowledge about:** • Safety precautions while performing arc welding. • Safe handling of work tools, equipment and materials • Proper waste disposal	• Gas welding goggles	
		(b) Performing down hand butt joint	**Discussions:** Guide the student to discuss how to Perform down hand butt joint **Demonstrations** Demonstrate to the students on	**The student should be able to:** •Interpret drawings •Select tools, equipment and materials •Take measurements.	down hand butt joint per formed per given instruction	**Knowledge evidence: Detailed knowledge of: Method used:** The student should explain how to: Performing down hand butt joint. **Principles:** The	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available: -**	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			Performing down hand butt joint **Hands on activity** Organise the students to Perform down hand butt joint	•Prepare welding joints •Adjust the welding flame. •Carry out down hand butt joint gas welding •Observe safety precautions •Clean tools, equipment, work piece and work place. •Store tools and equipment		student should explain the principles of: Performing down hand butt joint.. **Theories:** The student should explain: • Types of welding • Types of electrodes • Properties of materials • Application of AC and DC arc welding machines **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while performing arc welding	available: • Oxy-acetylene gas cylinders and accessories • Pair of tongs • Oxy-acetylene welding bench • Oxy-acetylene welding bay • Clamp. • Scriber • Steel rule • Hand grinding machine • Cylinder trolley • Safety boots • Overall • Gloves • Leather apron • Gas welding goggles	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
						• Safe handling of work tools, equipment and materials Waste disposal		
		(c) Performing down hand lap joint	**Discussions:** Guide the student to discuss how to Perform down hand lap joint **Demonstrations** Demonstrate to the students on Performing down hand lap joint **Hands on activity** Organise the students to Perform down hand lap joint	**The student should be able to:** •Interpret drawings •Select tools, equipment and materials •Take measurements. •Prepare welding joints. •Adjust the welding flame •Carry out down hand lap joint gas welding •Observe safety precautions •Clean tools, equipment,	down hand lap joint per formed per given instruction.	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to: Perform down hand lap joint **Principles:** The student should explain the principles of: Performing down hand lap joint **Theories:** The student should explain: • Application of AC and DC arc	**This element can be achieved at a work place or in a training institution.** **The following tools, equipment and safety gears are to be available:** - • Oxy-acetylene gas cylinders and accessories • Pair of tongs • Wire brush • Shearing machine • Oxy-acetylene welding bench • Oxy-acetylene welding bay	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
				work piece and work place •Store tools and equipment		welding machines **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while performing arc welding. • Safe handling of work tools, equipment and materials • Waste disposal	• Clamp • Scriber • Steel rule • Cylinder trolley • Safety boots • Overall • Gloves • Leather apron • Gas welding goggles	
		(d) Performing brazing	**Discussions:** Guide the student to discuss how to Perform brazing **Interactive simulation and animation** Guide the	**The student should be able to:** •Interpret drawings. •Select tools, equipment and materials •Take measurements	brazing per formed per given instruction	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to: Perform brazing **Principles:** The student should	**This element can be achieved at a work place or in a training institution.** **The following tools, equipment and safety gears are to be available:** **-**	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			student through interactive simulation and animation to visualise performing brazing **Demonstrations** Demonstrate to the students on Performing brazing **Hands on activity** Organise the students to Perform brazing	•Prepare joints •Carry out brazing •Observe safety precautions •Clean tools, equipment, work piece and work place •Store tools and equipment		explain the principles of: Performing brazing. **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while performing arc welding • Safe handling of work tools, equipment and materials • Waste disposal	• Oxy-acetylene gas cylinders and accessories • Pair of tongs • Wire brush • Chisel • Oxy-acetylene welding bench • Oxy-acetylene welding bay • Clam • Scriber • Steel rule • Grinding machine • Cylinder • trolley • Helmet • Safety boots • Overall • Gloves • Leather apron • Gas welding goggles	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
	1.3. Performing soldering	(a) Carrying out thin metal soldering	**Discussions:** Guide the student to discuss how to Carry out thin metal soldering **Demonstrations** Demonstrate to the students on Carrying out thin metal soldering **Hands on activity** Organise the students to Carry out thin metal soldering	**The student should be able to:** •Select tools, equipment and material •Prepare parts to be soldered •Perform thin metal soldering •Observe safety precautions •Clean tools, equipment, work piece and work place. •Store tools, equipment and work piece	Thin metal soldering carried out as per instruction	**Knowledge evidence: Detailed knowledge of: Method used:** The student should explain how to: Carry out thin metal soldering **Principles:** The student should explain the principles of carrying out soldering **Theories:** The student should explain: • Soldering process • Importance of soldering flux • Tools used in soldering process • Importance of	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available: -** • Soldering gun • Charcoal stove/blow lamp • thin metal • Wire brush • Work bench • Test hammer. • Spark lighter • Combination plier • Pair of tongs • Wire stripper • Tin snip • Gloves • Safety clear	90

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
						cleaning parts to be soldered **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while soldering. • Safe handling of tools, equipment and work piece • Waste disposal.	glasses • Overall • Safety boots	
2.0 Building simple electronic circuits	2.1. Determining characteristics of active electronic components	(a) Checking characteristics of diode	**Discussions:** Guide the student to discuss how to Check characteristics of diode **Demonstrations** Demonstrate to the students on Checking characteristics	**The student should be able to:** •Select relevant safety gears, tools and equipment •Select diode •Test diode •Record test results •Interpret	Diode characteristics checked and recorded as per instruction	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to Check characteristics of diode **Principles:** The student should	**This element can be achieved at a work place or in a training institution.** **The following tools, equipment and safety gears are to be available:** - • Digital and analogue	70

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			of diode **Hands on activity** Organise the students to Check characteristics of diode	standard test results •Observe safety regulations. •Clean tools, equipment and workplace •Store tools, equipment and components		explain the principles of: Checking characteristics of diode **Theories:** The student should explain: • Symbol of diode • characteristics of diode **Circumstantial knowledge:** **Detailed knowledge about:** Safety precautions in determining characteristics of active electronic components	multimeters • Oscilloscope • diodes • Tool kit. • Work bench • Curve tracer • Gloves • Overcoat	
		(b) Checking characteristics of transistors	**Discussions:** Guide the student to	**The student should be able to:**	Transistors characteristics checked and	**Knowledge evidence:** **Detailed**	**This element can be achieved at a work place or in a**	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			discuss how to Check characteristics of transistors **Demonstrations** Demonstrate to the students on Checking characteristics of transistors **Hands on activity** Organise the students to Check characteristics of transistors	•Select relevant safety gears, tools and equipment •Select transistor •Test transistor •Record test results •Interpret standard test results •Observe safety regulations. •Clean tools, equipment and workplace. •Store tools, equipment and components	recorded as per instruction	**knowledge of:** **Method used:** The student should explain how Check characteristics of transistors **Principles:** The student should explain the principles of: Checking characteristics of transistors **Theories:** The student should explain: • Characteristics of transistors • Variation of transistor performance with temperature **Circumstantial knowledge:** **Detailed**	**training institution.** **The following tools, equipment and safety gears are to be available:** **-** • Digital and analogue multimeters • Oscilloscope • transistors • Curve tracer. • Tool kit • Work bench • Gloves • Overcoat	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
						knowledge about: Safety precautions in determining characteristics of transistors		
		(c) Checking characteristics of thyristors	**Discussions:** Guide the student to discuss how to Check characteristics of thyristors **Demonstrations** Demonstrate to the students on Checking characteristics of thyristors **Hands on activity** Organise the students to Checking characteristics of thyristors	**The student should be able to:** •Select relevant safety gears, tools and equipment •Select thyristor •Test thyristors •Record test results •Interpret standard test results. •Observe safety regulations. •Clean tools, equipment and workplace. •Store tools, equipment and	Thyristors characteristics checked and recorded as per instruction	**Knowledge evidence: Detailed knowledge of: Method used:** The student should explain how to Check characteristics of thyristors **Principles:** The student should explain the principles of: Checking characteristics of thyristors **Theories:** The student should explain:	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available: -** • Digital and analogue multimeters • thyristors • Oscilloscope • Curve tracer • Tool kit • Work bench • Gloves • Overcoat	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
				components		• Types of thyristors. • Characteristics of thyristors • Variation of thyristor performance with temperature **Circumstantial knowledge:** **Detailed knowledge about:** Safety precautions in determining characteristics of thyristors		
		(d) Checking characteristics of opto-electronic devices	**Discussions:** Guide the student to discuss how to Check characteristics of opto-electronic devices	**The student should be able to:** •Select relevant safety gears, tools and equipment •Select opto-electronic	Opto-electronic devices. characteristics checked and recorded as per instruction	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to check characteristics of	**This element can be achieved at a work place or in a training institution.** **The following tools, equipment and safety gears are to be available:**	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			Demonstrations Demonstrate to the students on Checking characteristics of opto-electronic devices **Hands on activity** Organise the students to Check characteristics of opto-electronic devices	devices •Test opto-electronic devices •Record test results. •Interpret standard test results •Observe safety regulations •Clean tools, equipment and workplace •Store tools, equipment and components		opto-electronic devices **Principles:** The student should explain the principles of: Checking characteristics of opto-electronic devices **Theories:** The student should explain: • Types of opto-electronic devices • Characteristics of opto-electronic devices **Circumstantial knowledge:** **Detailed knowledge about:** Safety precautions	- • Digital and analogue multimeters • Oscilloscope • Curve tracer • Tool kit • opto-electronic devices • Work bench • Gloves • Overcoat	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
						in determining characteristics of active electronic components		
		(e) Checking characteristics of integrated circuits.	**Discussions:** Guide the student to discuss how to Check characteristics of integrated circuits **Demonstrations** Demonstrate to the students on Checking characteristics of integrated circuits **Hands on activity** Organise the students to Check characteristics of integrated circuits	**The student should be able to:** •Select relevant safety gears, tools and equipment. •Select integrated circuits. •Test integrated circuits. •Record test results. •Interpret standard test results. •Observe safety regulations. •Clean tools, equipment and workplace. •Store tools,	Integrated circuits characteristics checked and recorded as per instruction	**Knowledge evidence: Detailed knowledge of: Method used:** The student should explain how to Check characteristics of integrated circuits **Principles:** The student should explain the principles of: Checking characteristics of integrated circuits **Theories:** The student should explain: • Types of integrated	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available: -** • Digital and analogue multimeters • integrated circuits • Oscilloscope • Curve tracer • Tool kit • Work bench • Gloves • Overcoat	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
				equipment and components		circuits. • Characteristics of integrated circuits **Circumstantial knowledge:** **Detailed knowledge about:** Safety precautions in handling integrated circuits		
	2.2. Determining characteristics of passive electronic components	(a) Checking characteristics of resistor	**Discussions:** Guide the student to discuss how to Check characteristics of resistor **Demonstrations** Demonstrate to the students on Checking characteristics of resistor **Hands on activity**	**The student should be able to:** •Select relevant safety gears, tools and equipment •Select resistor. •Test resistor •Record test results •Interpret standard test results •Observe safety	Resistor characteristics checked and recorded as per instruction	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to: Check characteristics of resistor •Perform colour code identification **Theories: The student should explain:**	**This element can be achieved at a work place or in a training institution.** **The following tools, equipment and safety gears are to be available:** - • Digital and analogue multimeters • resistor • Oscilloscope.	70

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			Organise the students to Check characteristics of resistor	regulations. •Clean tools, equipment and workplace •Store tools, equipment and components		•Types of resistors. •Characteristics of resistor •resistor symbol. •Applications of resistor •Variation of resistor performance with temperature. •Safety precautions in determining characteristics of resistor. •Safe handling of tools, test equipment and measuring instruments	• Curve tracer • Tool kit • Work bench • Gloves • Overcoat • Overall • Boots	
		(b) Checking characteristics of capacitor	**Discussions:** Guide the student to discuss how to Check characteristics	**The student should be able to:** •Select relevant safety gears, tools and	Capacitor characteristics checked and recorded as per instruction	**Knowledge evidence: Detailed knowledge of Method used:** The student should	**This element can be achieved at a work place or in a training institution. The following**	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			of capacitor **Demonstrations** Demonstrate to the students on Checking characteristics of capacitor **Hands on activity** Organise the students to Check characteristics of capacitor	equipment •Select capacitor •Test capacitor. •Record test results •Interpret standard test results •Observe safety regulations. •Clean tools, equipment and workplace •Store tools, equipment and components		explain how to: Check characteristics of capacitor **Theories:** The student should explain: •capacitor symbol. •Applications of capacitor •Variation of capacitor performance with temperature **Circumstantial knowledge:** **Detailed knowledge about:** •Safety precautions in determining characteristics of capacitor •Safe handling of tools, test equipment and measuring instruments	**tools, equipment and safety gears are to be available:** - • Digital and analogue multimeters • capacitor • Oscilloscope • Curve tracer • Tool kit • Work bench • Gloves • Overcoat • Overall • Boots	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
						•Safe handling of capacitor		
		(c) Checking characteristics of inductor	**Discussions:** Guide the student to discuss how to Check characteristics of inductor **Demonstrations** Demonstrate to the students on Checking characteristics of inductor **Hands on activity** Organise the students to Check characteristics of inductor	**The student should be able to:** •Select relevant safety gears, tools and equipment •Select inductor •Test inductor •Record test results •Interpret standard test results •Observe safety regulations •Clean tools, equipment and workplace. •Store tools, equipment and components	inductor characteristics checked and recorded as per instruction	**Knowledge evidence: Detailed knowledge of: Method used:** The student should explain how Checking characteristics of inductor **Principles:** The student should explain the principles of: Checking characteristics of inductor **Theories:** The student should explain: • Characteristics of inductor • inductor symbol.	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available: -** • Digital and analogue multimeters • inductor • Oscilloscope • Curve tracer • Tool kit • Work bench. • Gloves • Overcoat • Overall Boots	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
						• Variation of inductor performance with temperature **Circumstantial knowledge:** **Detailed knowledge about:** • Safety precautions in determining characteristics of passive electronic inductor • Safe handling of tools, test equipment and measuring instruments • Safe handling of inductor		
	2.3. Constructing simple electronic circuits	(a) Constructing inductive circuit.	**Discussions:** Guide the student to	**The student should be able to:**	inductive circuit Constructed and recorded as per	**Knowledge evidence:** **Detailed**	**This element can be achieved at a work place or in a**	69

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			discuss how to Construct inductive circuit **Demonstrations** Demonstrate to the students on Constructing inductive circuit **Hands on activity** Organise the students to Construct inductive circuit	•Select relevant safety gears, tools, equipment and material. •Interpret circuit diagram •Select components. •Construct inductive circuit. •Solder constructed circuits. •Test built circuits •Observe safety precautions. •Clean tools, equipment and work place. •Store tools, equipment and electronic components	instruction	**knowledge of: Method used:** The student should explain how to: • Construct inductive circuit • Calculate value of inductive reactance, capacitance and resistance in series and parallel circuit **Principles:** The student should explain principles of: constructing inductive circuit **Theories:** The student should explain: • Characteristics of dc power supply components.	**training institution. The following tools, equipment and safety gears are to be available:** - • Work bench • inductive • Electronics board • Tool kit • Measuring tape • Analogue and digital multimeters. • Overall • Gloves • Safety goggles • Safety boots	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
						• Characteristics of inductors. • Application of different types of inductors **Circumstantial knowledge:** **Detailed knowledge about:** • Safety precautions when constructing simple inductive circuits • Safe handling of tools and electronic components		
		(b) Constructing capacitive circuit	**Discussions:** Guide the student to discuss how to Construct	**The student should be able to:** •Select relevant safety gears,	Capacitive circuit Constructed and recorded as per instruction	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The	**This element can be achieved at a work place or in a training institution.**	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			capacitive circuit **Demonstrations** Demonstrate to the students on Constructing capacitive circuit **Hands on activity** Organise the students to Construct capacitive circuit	tools, equipment and material •Interpret circuit diagram. •Select components •Construct capacitive circuit •Solder constructed circuits •Test built circuits •Observe safety precautions •Clean tools, equipment and work place •Store tools, equipment and electronic components		student should explain how to: • Construct capacitive circuit **Principles:** The student should explain principles of: Constructing capacitive circuit **Theories:** The student should explain: • Characteristics of capacitors. • Application of capacitive circuits. • Characteristics of capacitors. • Application of different types of capacitors **Circumstantial knowledge: Detailed**	**The following tools, equipment and safety gears are to be available:** - • Work bench • capacitive • Electronics board • Tool kit • Measuring tape • Analogue and digital multimeters. • Overall • Gloves • Safety goggles Safety boots	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
						knowledge about: • Safety precautions when constructing capacitive circuit • Safe handling of tools and electronic components		
		(c) Constructing resistive circuits	**Discussions:** Guide the student to discuss how to Construct resistive circuits **Demonstrations** Demonstrate to the students on Constructing resistive circuits **Hands on activity** Organise the	**The student should be able to:** •Select relevant safety gears, tools, equipment and material •Interpret circuit diagram. •Select components •Construct resistive circuit. •Solder constructed		**Knowledge evidence: Detailed knowledge of: Method used:** The student should explain how to: Constructing resistive circuits **Principles:** The student should explain principles of: Constructing resistive circuits	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available:** - • Work bench. • Resistor • Tool kit • Measuring tape.	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			students to Construct resistive circuits	circuits •Test built circuits. •Observe safety precautions. •Clean tools, equipment and work place. •Store tools, equipment and electronic components		**Theories:** The student should explain: • Application of resistive circuits • Reading resistor colour code **Circumstantial knowledge: Detailed knowledge about:** • Safety precautions when constructing resistive circuits • Safe handling of tools and electronic components.	• Analogue and digital multimeters • Overall. • Gloves • Safety goggles Safety boots	
		(d) Constructing (RLC) circuit	**Discussions:** Guide the	**The student should be able**	(RLC) circuit constructed and	**Knowledge evidence:**	**This element can be achieved at a**	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			student to discuss how to Construct (RLC) circuit **Demonstrations** Demonstrate to the students on Constructing (RLC) circuit **Hands on activity** Organise the students to Construct (RLC) circuit	**to:** •Select relevant safety gears, tools, equipment and material. •Interpret circuit diagram. •Select components. •Construct RLC circuit. •Solder constructed circuits. •Test built circuits. •Observe safety precautions. •Clean tools, equipment and work place. •Store tools, equipment and electronic components	recorded as per instruction	**Detailed knowledge of:** **Method used:** The student should explain how to: Constructing (RLC) circuit **Principles:** The student should explain principles of: Constructing (RLC) circuit **Theories:** The student should explain: • Application of (RLC) circuit **Circumstantial knowledge:** **Detailed knowledge about:** • Safety precautions when Constructing (RLC) circuit	**work place or in a training institution.** **The following tools, equipment and safety gears are to be available:** - • Work bench. • (RLC) components • Tool kit • Measuring tape • Analogue and digital multimeters • Overall • Gloves • Safety goggles • Safety boots	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
						• Safe handling of tools and electronic components		
		(e) constructing rectifier circuits	**Discussions:** Guide the student to discuss how to construct rectifier circuits **Demonstrations** Demonstrate to the students on constructing rectifier circuits **Hands on activity** Organise the students to construct rectifier circuits	**The student should be able to:** •Select relevant safety gears, tools, equipment and material. •Interpret circuit diagram. •Select components. •Construct rectifier circuit. •Solder constructed circuits. •Test built circuits. •Observe safety precautions. •Clean tools,	Rectifier circuits constructed and recorded as per instruction	**Knowledge evidence: Detailed knowledge of: Method used:** The student should explain how to: Construct rectifier circuits **Principles:** The student should explain principles of: constructing rectifier circuits **Theories:** The student should explain: .	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available: -** • Work bench • Rectifier components • Tool kit • Measuring tape. • Analogue and digital Multimeter • Overall. • Gloves	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
				equipment and work place. •Store tools, equipment and electronic components		• Application of rectifier circuits. **Circumstantial knowledge:** **Detailed knowledge about:** • Safety precautions when) constructing rectifier circuits • Safe handling of tools and electronic components	• Safety goggles • Safety boots	
3.0 Carrying out engine service	3.1. Performing engine maintenance	(a) Changing engine oil	**Discussions:** Guide the student to discuss how to Change engine oil **Demonstrations** Demonstrate to the students on Changing	**The student should be able to:** •Use service manual •Select tools, appropriate oil type and equipment •Check engine	Engine maintenance performed manufactures guideline	**Knowledge evidence:** **Detailed knowledge of:** Change engine oil **Method used:** The student should explain how to: Change engine oil	**This element can be achieved at a work place or in a training institution.** **The following tools, equipment and safety gears are to be available:** -	65

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			engine oil **Hands on activity** Organise the students to Change engine oil	oil •Test engine •Observe safety rules and precautions •Clean tools, equipment and work place •Store tools •Dispose wastes		**Principles:** The student should explain the principles of Changing engine oil **Theories:** The student should explain: - Importance of changing engine oil **Circumstantial knowledge** **Detailed knowledge about:** • Safety precaution while Changing engine oil . • Safe handling of tools and equipment Proper waste disposal procedures	• Motorcycle (with complete engine) • Tool kit • engine oil • Fuel pressure gauge • container for used oil • Funnel • Gloves • Overall • Safety boots • Safety clear glasses • Manufacturer's service manual • Oil can	
		(b) Carrying out	**Discussions:**	**The student**	valve adjustment	**Knowledge**	**This element can**	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
		valve adjustment	Guide the student to discuss how to Carry out valve adjustment **Demonstrations** Demonstrate to the students on Carrying out valve adjustment **Hands on activity** Organise the students to Carry out valve adjustment	**should be able to:** •Use service manual •Select tools and equipment •Adjust valve mechanism •Test engine •Observe safety rules and precautions •Clean tools, equipment and work place •Store tools •Dispose wastes	performed as manufactures guideline	**evidence:** **Detailed knowledge of:** Carrying out valve adjustment **Method used:** The student should explain how to: Perform valve adjustments **Principles:** The student should explain the principles of Carrying out valve and valve mechanism adjustment. **Theories:** The student should explain: - • Importance of Carrying out valve and valve mechanism adjustment. • Operations of	**be achieved at a work place or in a training institution.** **The following tools, equipment and safety gears are to be available:** - • Motorcycle (with complete engine) • Tool kit • Multimeter • Gloves • Overall • Safety boots • Safety clear glasses • Fire extinguisher • Manufacturer's service manual • Oil can	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
						different types of valve mechanism • Importance of adjusting valve and their mechanism **Circumstantial knowledge** **Detailed knowledge about:** • Safety precaution while carrying out valve and valve mechanism adjustment. • Safe handling of tools and equipment		
	3.2. Performing engine cooling service	(a) Servicing engine cooling components	**Discussions:** Guide the student to discuss how to Service engine	**The student should be able to:** •Use service manual	Engine cooling components performed as manufactures guideline	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The	**The following tools, equipment and safety gears are to be available:** **-**	63

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			cooling components **Demonstrations** Demonstrate to the students on Servicing engine cooling components **Hands on activity** Organise the students to Service engine cooling components	•Select tools and equipment •Service cooling system •Observe safety precautions •Test serviced cooling system •Clean tools, equipment and work place •Store tools and equipment •Proper dispose wastes		student should explain how to: Service engine cooling components **Principles:** The student should explain the principles of: • Servicing engine cooling system • Testing engine cooling system **Theories:** The student should explain: - • Importance of servicing engine cooling components • Effect of engine working in under heating and overheating temperatures • Importance of	• Motorcycle (with complete engine) • Tool kit • Cooling system pressure tester • Air compressor • Gloves • Overall • Safety boots • Safety clear glasses Service manual	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
						thermostat in cooling system **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while performing service of engine cooling components. • Safe handling of tools and equipment • Proper waste disposal procedures		
		(b)Replacing engine cooling system components and parts	**Discussions:** Guide the student to discuss how to Replace engine cooling system	**The student should be able to:** •Use service manual •Select tools and	Engine cooling system components and parts replaced as per manufactures guideline	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should	**This element can be achieved at a work place or in a training institution.** **The following**	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			components and parts **Demonstrations** Demonstrate to the students on Replacing engine cooling system components and parts **Hands on activity** Organise the students to Replace engine cooling system components and parts	equipment •Check engine cooling system •Observe safety precautions •Test serviced cooling system •Clean tools, equipment and work place •Store tools and equipment •Proper dispose wastes		explain how to: Replacing engine cooling system components and parts **Principles:** The student should explain the principles of: • Replacing engine cooling system components and parts • Testing engine cooling system **Theories:** The student should explain: - • Importance of replacing engine cooling system components and parts • Importance of thermostat in	**tools, equipment and safety gears are to be available:** - • Motorcycle (with complete engine) • Engine cooling system components and parts • Tool kit • Coolant • Cooling system pressure tester • Air compressor • Gloves • Overall • Safety boots • Safety clear glasses Service manual	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
						cooling system **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while performing Replacement of engine cooling system components and parts. • Safe handling of tools and equipment • Proper waste disposal procedures		
	3.3. Performing fuel system service	(a) Performing carburettor service	**Discussions:** Guide the student to discuss how to Perform	**The student should be able to:** •Use service manual	Carburettor service performed as per manufactures guideline	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The	**This element can be achieved at a work place or in a training institution.**	63

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			carburettor service **Demonstrations** Demonstrate to the students on Performing carburettor service **Hands on activity** Organise the students to Performing carburettor service	•Observe safety rules and precautions •Select tools and equipment •Service carburettor •Check carburettor •Test carburettor •Clean tools, equipment and workplace •Store tools and equipment •Proper dispose wastes		student should explain how to: Perform carburettor service **Principles:** The student should explain principles of: Performing carburettor service **Theories:** The student should explain: - Importance of performing carburettor service **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while Performing carburettor service	**The following tools, equipment and safety gears are to be available:** - • Motorcycle with carburetor • Tool kit • Fuel pressure gauge • Vacuum gauge • Air compressor • Overall • Safety boot • Safety clear • glasses Service manual	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
						• Safe handling of tools and equipment • Waste disposal methods		
		(b). Carrying out air filter service	**Discussions:** Guide the student to discuss how to Carry out air filter service **Demonstrations** Demonstrate to the students on Carrying out air filter service **Hands on activity** Organise the students to Carry out air filter service	**The student should be able to:** •Use service manual •Observe safety rules and precautions •Select tools and equipment •Service air cleaner •Clean tools, equipment and workplace •Store tools and equipment •Proper dispose wastes	Air filter service carried out as per manufactures guideline	**Knowledge evidence: Detailed knowledge of: Method used:** The student should explain how to: Carrying out air filter service **Principles:** The student should explain principles of: Carrying out air filter service **Theories:** The student should explain: - Importance of	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available:** - • Motorcycle • Tool kit • air filter • Air compressor • Overall • Safety boot • Safety clear glasses • Service manual	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
						carrying out air filter service **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while). Carrying out air filter service system. • Safe handling of tools and equipment • Waste disposal methods		
		(c) Carrying out fuel lines service	**Discussions:** Guide the student to discuss how to Carry out fuel lines service **Demonstrations**	**The student should be able to:** •Use service manual •Observe safety rules and	Fuel lines service carried out as per manufactures guideline	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to:	**This element can be achieved at a work place or in a training institution.** **The following tools, equipment**	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			Demonstrate to the students on Carrying out fuel lines service **Hands on activity** Organise the students to Carry out fuel lines service	precautions •Select tools and equipment •Service fuel lines •Clean tools, equipment and workplace •Store tools and equipment •Proper dispose wastes		Carry out fuel lines service **Principles:** The student should explain principles of: • Carry out fuel lines service • Servicing fuel lines **Theories:** The student should explain: - • Importance of Carrying out fuel lines service **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while performing fuel lines service.	**and safety gears are to be available:** - • Motorcycle • fuel lines • Tool kit • Fuel pressure gauge • Vacuum gauge • Air compressor • Overall • Safety boot • Safety clear glasses • Service manual	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
						• Safe handling of tools and equipment Proper waste disposal		
4.0 Carrying out repairing of wheel and tyres	4.1 Performing tyres service	(a) Replacing worn tyres	**Discussions:** Guide the student to discuss how to Replace worn tyres **Demonstrations** Demonstrate to the students on Replacing worn tyres **Hands on activity** Organise the students to Replace worn tyres	**The student should be able to:** •Use service manual •Select tools and equipment •Test tyre •Observe safety precautions •Store clean tools, equipment and workplace •Store tools and equipment •Properly dispose wastes	Worn tyres replaced as per manufactures guideline	**Knowledge evidence:** **Detailed knowledge of Method used:** The student should explain how to: Replacing worn tyres. **Principles:** The student should explain principles of: • Replace/refix tyre **Theories:** The student should explain ways of replacing worn tyres. **Circumstantial**	**This element can be achieved at a work place or in a training institution.** **The following tools, equipment and safety gears s are to be available:** **-** • Complete tyre • Tool kit • Tyre pressure gauges • Tyre pressure gauge • Air compressor • Overall • Safety boots • Service manual	41

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
						knowledge **Detailed knowledge about:** • Safety precautions while replacing worn tyres. • Safe handling of tools and equipment		
		(b) Repairing punctures	**Discussions:** Guide the student to discuss how to Repair punctures **Demonstrations** Demonstrate to the students on Repairing punctures **Hands on activity** Organise the students to	**The student should be able to:** •Use service manual •Select tools and equipment •Service tyre •Test tyre •Observe safety precautions •Store clean tools, equipment and workplace •Store tools and equipment	Punctures repaired as per manufactures guideline	**Knowledge evidence:** **Detailed knowledge of Method used:** The student should explain how to: Repair punctures **Principles:** The student should explain principles of: Repairing punctures **Theories:** The	**This element can be achieved at a work place or in a training institution.** **The following tools, equipment and safety gears are to be available:** **-** • Tyre repair kit • Tyre repair material • Tool kit • Air compressor	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			Repair punctures	•Properly dispose wastes		student should explain: - • Importance of Repairing punctures • Effects of under inflation and over inflation **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while repairing punctures • Safe handling of tools and equipment • Proper waste disposal	• Tie pressure gauges • Overall • Safety boot • Safety clear glasses • Service manual	
		(c). Refilling tyres pressure	**Discussions:** Guide the student to	**The student should be able to:**	Tyres pressure refiled as per manufactures	**Knowledge evidence:** **Detailed**	**This element can be achieved at a work place or in a**	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			discuss how to Refill tyres pressure **Demonstrations** Demonstrate to the students on Refilling tyres pressure **Hands on activity** Organise the students to Refill tyres pressure	Refill tyres pressure •Select tools and equipment •Check tyre pressure •Adjust tyre pressure •Test tyre •Observe safety precautions •Store clean tools, equipment and workplace •Store tools and equipment •Properly dispose wastes	guideline	**knowledge of Method used:** The student should explain how to: Refill tyre pressure **Principles:** The student should explain principles of: Refilling tyre pressure **Theories:** The student should explain: - • Importance of Refilling tyres pressure • Effects of under inflation and over inflation **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions	**training institution.** **The following tools, equipment and safety gears are to be available:** **-** • Tyre • Tool kit • Air compressor • Tie pressure gauges • Overall • Safety boot • Safety clear glasses • Service manual	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
						while refilling tyres • Safe handling of tools and equipment		
	4.2 Repairing tube and tubeless tyres	(a) Repairing tube tyres	**Discussions:** Guide the student to discuss how to Repair tube tyres **Demonstrations** Demonstrate to the students on Repairing tube tyres **Hands on activity** Organise the students to Repair tube tyres	**The student should be able to:** •Use service manual •Select tools and equipment •Check tyre pressure •Adjust tyre pressure •Repair tubed tyres •Test tyre •Clean tyre •Observe safety rules and precautions •Clean tools, equipment and work place	Tube tyres repaired as per manufactures guideline	**Knowledge evidence: Detailed knowledge of: Method used:** The student should explain how to: Repairing tube tyres. **Principles:** The student should explain principles of repairing tubed tyres. **Theories:** The student should explain: - importance of repairing tube tyres.	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available: -** • tubed tyres • Tool kit • Air compressor • Tie pressure gauges • Overall • Safety boot • Safety clear glasses	41

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
				•Store tools and equipment		**Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while repairing tube tyres • Safe handling of tools and equipment • Proper waste disposal methods	• Service manual	
		(b) Repairing tubeless tyres	**Discussions:** Guide the student to discuss how to Repair tubeless tyres	**The student should be able to:** •Use service manual •Select tools and equipment	Tubeless tyres repaired as per manufactures guideline	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should	**This element can be achieved at a work place or in a training institution.** **The following tools, equipment**	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			Demonstrations Demonstrate to the students on Repairing tubeless tyres **Hands on activity** Organise the students to Repair tubeless tyres	•Check tyre pressure •Adjust tyre pressure •Repair tubeless tyres •Test tyre •Clean tyre •Observe safety rules and precautions •Clean tools, equipment and work place •Store tools and equipment		explain how to: • Check tyre pressure • Repair tubeless tyre **Principles:** The student should explain principles of repairing tubeless tyres. **Theories:** The student should explain: - Importance of Repairing tubeless tyres **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while repairing tubeless tyres. • Safe handling of tools and equipment • Proper waste	**and safety gears are to be available:** - • Tubeless tyres • Tool kit • Air compressor • Tie pressure gauges • Overall • Safety boot • Safety clear glasses • Service manual	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
						disposal methods		
	4.3 Performing wheel balance	(a). Carrying out static balance	**Discussions:** Guide the student to discuss how to Carry out static balance **Demonstrations** Demonstrate to the students on Carrying out static balance **Hands on activity** Organise the students to Carry out static balance	**The student should be able to:** •Use service manual •Select tools and equipment •Check tyre pressure •Set wheel balance machine •Fit balance weight •Observe safety precautions •Test wheel balance •Clean tools, equipment and work place •Store tools and equipment	Static balance carried out as per manufactures guideline	**Knowledge evidence: Detailed knowledge of: Method used:** The student should explain how to: Carrying out static balance **Principles:** The student should explain principles of: Performing static wheel balance. **Theories:** The student should explain: - Importance of performing static wheel balance	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available:** - - • Static wheel balancing machine • Tool kit • Air compressor • Overall • Safety boot • Safety clear glasses • Service manual	41

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
				•Dispose wastes		**Circumstantial knowledge Detailed knowledge about:** • Safety precautions while performing static wheel balance. • Safe handling of tools and equipment • Proper waste disposal methods		
		(b) Carrying out dynamic balance	**Discussions:** Guide the student to discuss how to Carry out dynamic balance **Demonstrations** Demonstrate to	**The student should be able to:** •Use service manual •Select tools and equipment •Check tyre pressure	Dynamic balance carried out as per manufactures guideline	**Knowledge evidence: Detailed knowledge of: Method used:** The student should explain how to: Carry out dynamic balance	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available:**	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			the students on Carrying out dynamic balance **Hands on activity** Organise the students to Carry out dynamic balance	•Set wheel balance machine •Fit balance weight •Observe safety precautions •Test wheel balance •Clean tools, equipment and work place •Store tools and equipment •Dispose wastes		**Principles:** The student should explain principles of: Performing dynamic wheel balance **Theories:** The student should explain: - • Types of wheel balance • Importance of performing wheel balance **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while performing wheel balance. • Safe handling of tools and equipment	- • Dynamic wheel balancing machine • Tool kit • Air compressor • Overall • Safety boot • Safety clear glasses • Service manual	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
						• Proper waste disposal methods		
	4.4. Aligning wheels	(a) Adjusting wheel sprocket	**Discussions:** Guide the student to discuss how to Adjust wheel sprocket **Demonstrations** Demonstrate to the students on Adjusting wheel sprocket **Hands on activity** Organise the students to Adjust wheel sprocket	**The student should be able to:** •Use service manual •Select tools and equipment •Perform wheel sprocket alignment •Carry out test •Observe safety precautions •Clean tools, equipment and work place •Store tools and equipment •Dispose wastes	Wheel sprocket adjusted as per manufactures guideline	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to: Adjust wheel sprocket **Principles:** The student should explain principles of Adjusting wheel sprocket **Theories:** The student should explain: - Importance of performing Adjusting of wheel sprocket	**This element can be achieved at a work place or in a training institution.** **The following tools, equipment and safety gears are to be available:** - - • Service manual • Tool kit • Special wheel sprocket alignment toot • Overall • Safety boot • Gloves • Safety clear glasses	41

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
						Circumstantial knowledge **Detailed knowledge about:** • Safety precautions while performing wheel sprocket adjustment • Safe handling of tools, equipment and environment • Proper waste disposal methods		
		(b) Performing wheel rim Alignment	**Discussions:** Guide the student to discuss how to Perform wheel rim alignment **Demonstrations** Demonstrate to	**The student should be able to:** •Use service manual •Select tools and equipment •Check wheel alignment	Wheel rim Alignment performed as per manufactures guideline	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to: • Perform wheel rim alignment	**This element can be achieved at a work place or in a training institution.** **The following tools, equipment and safety gears are to be available:**	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			the students on Performing wheel rim alignment **Hands on activity** Organise the students to Performing wheel rim Alignment	•Perform wheel rim alignment •Carry out test •Observe safety precautions •Clean tools, equipment and work place •Store tools and equipment •Dispose		• **Principles:** The student should explain principles of: • Performing wheel rim Alignment • Using wheel alignment software **Theories:** The student should explain: - Importance of performing wheel rim Alignment. **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while Performing wheel rim Alignment • Safe handling	- • Service manual • Tool kit • Special wheel rim alignment tool • Overall • Safety boot • Gloves • Safety clear glasses	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
						of tools, equipment and environment • Proper waste disposal methods		
	4.5. Servicing wheel hubs	(a) Servicing wheel hub components.	**Discussions:** Guide the student to discuss how to Service wheel hub components **Demonstrations** Demonstrate to the students on Servicing wheel hub components **Hands on activity** Organise the students to Service wheel hub components	**The student should be able to:** •Use service manual •Select tools and equipment •Perform wheel hub components service •Carry out test •Observe safety precautions •Clean tools, equipment and work place •Store tools and equipment •Dispose wastes	Wheel hub components serviced as per manufactures guideline	**knowledge evidence: Detailed knowledge of:** Servicing wheel hub components **Method used:** The student should explain how to: Service wheel hub components **Principles:** The student should explain principles of: • Servicing wheel hub components • Replacing	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available:** - • Service manual • Wheel hub components. • Tool kit • Kerosene • Oil can • Lubricants • Air compressor	41

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
						wheel hub components • Testing wheel hub components **Theories:** The student should explain: - Importance of servicing wheel hub components **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while servicing wheel hub components. • Safe handling of tools and equipment • Proper waste disposal	• Snap ring pliers • Overall • Safety boot • Gloves • Safety clear glasses	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
		(b). Adjust wheel bearing taps play.	**Discussions:** Guide the student to discuss how to Adjust wheel bearing taps play **Demonstrations** Demonstrate to the students on Adjust wheel bearing taps play **Hands on activity** Organise the students to Adjust wheel bearing taps play	**The student should be able to:** •Use service manual •Select tools and equipment •Perform wheel bearing taps play adjustment. •Carry out test •Observe safety precautions •Clean tools, equipment and work place •Store tools and equipment •Dispose wastes	Wheel bearing taps play adjusted as per manufactures guideline	**Knowledge evidence:** **Detailed knowledge of:** Adjusting wheel bearing taps play. **Method used:** The student should explain how to: Adjust wheel bearing taps play **Principles:** The student should explain principles of: • Adjust wheel bearing taps play. **Theories:** The student should explain: - • Functions of wheel hub • Types of wheel hub • Importance of servicing wheel	**This element can be achieved at a work place or in a training institution.** **The following tools, equipment and safety gears are to be available:** - • Service manual • Tool kit • Air compressor • Snap ring pliers • Overall • Safety boot • Gloves • Safety clear glasses	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
						hub **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while Adjust wheel bearing taps play. • Safe handling of tools and equipment • Proper waste disposal		
5.0 Performing service of steering and suspension systems	5.1 performing steering system service	(a). Servicing steering column	**Discussions:** Guide the student to discuss to explain how to Service steering column **Demonstrations** Demonstrate to	**The student should be able to:** •Use service manual •Select tools and equipment •Check steering system components	Steering column serviced as per manufactures guideline	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to: Service steering column **Principles:** The	**This element can be achieved at a work place or in a training institution.** **The following tools, equipment and safety gears are to be available:** **-**	103

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			the students on Servicing steering column **Hands on activity** Organise the students to Service steering column	•Repair steering system components •Clean tools, equipment and working place •Store and keep tools and equipment		student should explain principle of: Servicing steering column **Theories:** The student should explain: - • Importance of using manufacturer's service manual • Importance of Servicing steering column **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while Servicing steering column • Proper waste	• Motorcycle • Steering Tool kit • Wheel remover trolley • Motor cycle lift • Motorcycle stands • Grease gun • Bearing remover kit • Gloves • Overall	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
						disposal method		
		(b) Adjusting steering bearings	**Discussions:** Guide the student to discuss to explain how to Adjust steering bearings **Demonstrations** Demonstrate to the students on Adjusting steering bearings **Hands on activity** Organise the students to Adjust steering bearings	**The student should be able to:** •Use service manual •Select tools and equipment •Check steering system components •Adjust steering system components •Clean tools, equipment and working place •Store and keep tools and equipment	Steering bearing adjustment performed as per manufactures guidelines	**Knowledge evidence: Detailed knowledge of: Method used:** The student should explain how to: • Adjust head bearing • Align steering handle bar **Principles:** The student should explain principle of: • Adjusting steering head bearing and • Align steering handle bar **Theories:** The student should explain: - • Importance of using	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available:** - • Motorcycle • Steering Tool kit • Wheel remover trolley • Motor cycle lift • Motorcycle stands • Grease gun • Bearing remover kit • Gloves	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
						manufacturer's service manual • Importance of adjusting of head bearing • Importance of aligning steering handle bar **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while Adjusting steering bearings • Safe handling of tools and equipment • Proper waste disposal	• Overall	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
	5.2. Performing suspension system service	(a.) Servicing front suspension	**Discussions:** Guide the student to discuss how to Service front suspension **Demonstrations** Demonstrate to the students on Servicing front suspension front **Hands on activity** Organise the students to Service front suspension	**The student should be able to**: •Use service manual •Select tools and equipment •Check front suspension system components •Adjust front suspension system components •Repair front suspension system components •Observe safety precautions •Clean tools, equipment and working place •Store and keep tools and	Front suspension serviced as per manufactures guideline	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to: • Service front suspension **Principles:** The student should explain principles of: • Servicing front suspension g front suspension **Theories:** The student should explain:- • Importance of servicing front suspension **Circumstantial**	**This element can be achieved at a work place or in a training institution.** **The following tools, equipment and safety gears are to be available:** **-** • Motorcycle • Suspension Tool kit • Grease gun • Wheel remover trolley • Motor cycle lift • Motorcycle stands • Bearing remover kit • Dial indicator • Gloves	103

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
				equipment •Proper dispose wastes		**knowledge** **Detailed knowledge about:** • Safety precautions while servicing front suspension. • Safe handling of tools and equipment • Waste disposal methods		
		(b). Servicing rear suspension	**Discussions:** Guide the student to discuss how to Service rear suspension **Demonstrations** Demonstrate to the students on Servicing rear suspension	**The student should be able to**: •Use service manual •Select tools and equipment •Check rear suspension system components •Adjust rear	Rear suspension serviced as per manufactures guideline	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to: • Servicing rear suspension • Test coil and leaf spring suspension	**This element can be achieved at a work place or in a training institution.** **The following tools, equipment and safety gears are to be available: -** **available: -**	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			Hands on activity Organise the students to Service rear suspension	suspension system components •Repair rear suspension system components •Observe safety precautions •Clean tools, equipment and working place •Store and keep tools and equipment •Dispose wastes		tension **Principles:** The student should explain principles of: • Servicing rear suspension system components **Theories:** The student should explain: - • Importance of Servicing rear suspension • Importance of servicing swing arm • Importance of testing coil spring tension **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions	• Motorcycle • Suspension Tool kit • Grease gun • Wheel remover trolley • Motor cycle lift • Motorcycle stands • Bearing remover kit • Gloves	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
						while Servicing rear suspension • Safe handling of tools and equipment • Waste disposal methods		

Form Three

Table 5: *Detailed Contents for Form Three*

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
1.0 Performing service of transmission system	1.1. Performing service of gear box	(a) Changing gear box oil	**Discussions:** Guide the student to discuss how to Change gear box oil **Demonstrations** Demonstrate to the students on Changing gear box oil **Hands on activity** Organise the students to Change gear box oil	**The student should be able to:** •Use service manual •Select tools and equipment •Clean gear box •change gearbox oil •Clean tools and equipment and work area •Store properly the tools and equipment	Gear box oil changed as per manufacture s guideline	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The trainee should explain how to: Change gear box oil **Principles:** The trainee should explain principles of: Changing gear box oil **Theories:** The trainee should explain: - Importance of changing gear box oil. **Circumstantial knowledge**	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available: -** • Motorcycle with Gear box unit • Tool kits • Waste oil container • Oil can • Gearbox oil • Air compressor • Cleaning material • Overall • Safety boots • Safety clear glasses	50

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
						Detailed knowledge about: • Safety precautions while Changing gear box oil • Safe handling of tools and equipment • Proper waste disposal	• Gloves	
		(b) Inspecting gear box	**Discussions:** Guide the student to discuss how to Inspect gear box **Demonstrations** Demonstrate to the students on	**The student should be able to:** •Use service manual •Select tools and equipment •Clean gear box •Inspect gear box •Inspect gear box worn	Gear box inspected as per manufacture s guideline	**Knowledge evidence: Detailed knowledge of: Method used:** The trainee should explain how to:	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears should be available: -**	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			Inspecting gear box **Hands on activity** Organise the students to Inspect gear box	out part •Clean tools and equipment and work area •Store tools and equipment		Inspect gear box. **Principles:** The trainee should explain principles of: Inspecting gear box **Theories:** The trainee should explain: - Importance of Inspecting gear box **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while Inspecting gear box • Safe handling of tools and equipment • Proper waste	• Gear box unit • Tool kits • Oil can • Overall • Safety boots • Safety clear glasses • Gloves	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
						disposal		
	1.2. Performing clutch system service	(a) Adjusting clutch cable	**Discussions:** Guide the student to discuss how to Adjust clutch cable **Demonstrations** Demonstrate to the students on Adjusting clutch cable **Hands on activity** Organise the students to Adjusting clutch cable	**The student should be able to:** •Use service manual •Select tools and equipment •Inspect clutch cable system •Adjust clutch cable system components •Test clutch cable efficiency •Clean tools and equipment	Clutch cable adjusted as per manufacture s guideline	**Knowledge evidence: Detailed knowledge of: Method used:** The trainee should explain how to: Adjusting clutch cable **Principles:** The trainee should explain Principles of: Adjusting clutch cable **Theories:** The trainee should explain: - Importance of adjusting clutch cable **Circumstantial knowledge**	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available: -** • Motorcycle • Tool kit • clutch cable • Gloves • Overall • Safety boots • Safety clear glasses • Service manual • Lifting jack Wedges	50

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
						Detailed knowledge about: • Safety precautions while adjusting clutch cable • Safe handling of tools and equipment • Proper waste disposal		
		(b) Inspecting clutch systems	**Discussions:** Guide the student to discuss how to inspect clutch systems **Demonstrations** Demonstrate to the students on Inspecting clutch systems	**student should be able to:** •Use service manual •Select tools and equipment •Inspect clutch system •Adjust clutch system components •Dismantle clutch •Replace clutch components	Clutch systems inspected as per manufacture s guideline	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The trainee should explain how to: Inspect clutch systems **Principles:** The trainee should	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available: -** • Motorcycle with clutch system	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			Hands on activity Organise the students to inspect clutch systems	•Assemble clutch •Test clutch efficiency •Clean tools and equipment		explain Principles of: Inspecting clutch systems **Theories:** The trainee should explain: - Importance of inspecting clutch systems **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while inspecting clutch systems • Safe handling of tools and equipment • Proper waste disposal	• Tool kit • Measuring tools • Air compressor • Gloves • Overall • Safety boots • Safety clear glasses • Service manual • Lifting jack • Wedges	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
	1.3. Maintaining chain and sprockets	(a) Adjusting chain tension	**Discussions:** Guide the student to discuss how to Adjust chain tension **Demonstrations** Demonstrate to the students on Adjusting chain tension **Hands on activity** Organise the students to adjust chain tension	**The student should be able to:** •Use service manual •Select tools, equipment and safety gears •Clean drive chain and sprocket •Adjust drive chain tension •Test chain and sprockets •Clean tools and equipment •Store tools and equipment	Chain tension adjusted as per manufacturers guideline	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The trainee should explain how to: Inspect clutch systems **Principles:** The trainee should explain Principles of: Inspecting clutch systems **Theories:** The trainee should explain: - Importance of inspecting clutch systems **Circumstantial knowledge** **Detailed knowledge about:** • Safety	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available: -** • Tool kits • Oil can • Chain special tools kit • Motorcycle lift • Motorcycle safe stand • Gloves • Safety boots • Overall	51

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
						precautions while inspecting clutch systems • Safe handling of tools and equipment • Proper waste disposal		
		(b). Servicing chain and sprockets	**Discussions:** Guide the student to discuss how to Service chain and sprockets **Demonstrations** Demonstrate to the students on Servicing chain and sprockets **Hands on activity**	**The student should be able to:** •Use service manual •Select tools, equipment and safety gears •Clean drive chain and sprocket •Check drive chain and sprocket teeth conditions •Repair drive chain and sprockets •Adjust drive chain tension •Test chain and	Chain and sprockets serviced as per manufacture s guideline	**Knowledge evidence: Detailed knowledge of: Method used:** The trainee should explain how to: . Service chain and sprockets **Principles:** The trainee should explain Principles of: . Servicing chain	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available: - available: -** • Motorcycle with chain and spokes • Tool kits • Oil can	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			Organise the students to Service chain and sprockets	sprockets •Clean tools and equipment •Store tools and equipment		and sprockets **Theories:** The trainee should explain: - Importance of . Servicing chain and sprockets **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while. Servicing chain and sprockets • Safe handling of tools and equipment • Proper waste disposal	• Chain special tools kit • Motorcycle lift • Motorcycle safe stand • Gloves • Safety boots • Overall	
	1.4. Performing drive shaft and	(a). Carrying out drive shaft	**Discussions:** Guide the student	**The student should be able to:**	Drive shaft Alignment	**Knowledge**	**This element can be achieved at a work**	51

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
	final drive service	Alignment	to discuss how to Carry out drive shaft Alignment **Demonstrations** Demonstrate to the students on Carrying out drive shaft Alignment **Hands on activity** Organise the students to carry out drive shaft Alignment	•Use service manual •Select tools and equipment •Repair final driver drive chain and sprockets •Repair differential unit •Repair drive shaft and universal joint •Adjust final drive backlash and gear •Test final drive •Clean tools and equipment •Store tools and equipment	carried out as per manufacture s guideline	**evidence: Detailed knowledge of: Method used:** The student should explain how to: Carry out drive shaft Alignment **Principles:** The student should explain principles of: Carrying out drive shaft Alignment **Theories: The student should** explain:- •Importance of Carrying out drive shaft Alignment •Importance of Carrying out drive shaft Alignment **Circumstantial**	**place or in a training institution. The following tools, equipment and safety gears are to be available: -** • Motorcycle with drive shaft • Service manual • Tool kits • Oil can • Dial indicator • Chain special tools kit • Motorcycle lift • Safety stand • Gloves • Safety boots	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
						knowledge **Detailed knowledge about**: •Safety precautions while carrying out drive shaft Alignment •Safe handling of tools and equipment •proper waste disposal		
		(b). Inspecting drive shaft and final drive components	**Discussions:** Guide the student to discuss how to Inspect drive shaft and final drive components **Demonstrations** Demonstrate to the students on Inspecting drive	**The student should be able to:** •Use service manual •Select tools and equipment •Repair final driver drive chain and sprockets •Repair differential unit •Repair drive shaft and universal joint •Adjust final drive	Drive shaft and final drive components inspected as per manufacture s guideline	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The trainee should explain how to: Inspect drive shaft and final drive components	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available: -** • Motorcycle with drive shaft and	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			shaft and final drive components **Hands on activity** Organise the students to inspect drive shaft and final drive components	backlash and gear •Test final drive •Clean tools and equipment •Store tools and equipment		**Principles:** The trainee should explain principles of: Inspecting drive shaft and final drive components **Theories:** The trainee should explain: - • Importance of using service manual • Importance of Inspecting drive shaft and final drive components **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while Inspecting	final drive components • Service manual • Tool kits • Oil can • Dial indicator • Chain special tools kit • Motorcycle lift • Safety stand • Gloves • Safety boots	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
						drive shaft and final drive components • Safe handling of tools and equipment • Waste disposal		
2.0 Carrying out chassis service	2.1. Maintaining three wheeled body	(a). Dismounting three wheeled body	**Discussions:** Guide the student to discuss how to dismount three wheeled body **Demonstrations** Demonstrate to the students on dismounting three wheeled body **Hands on activity** Organise the	**The student should be able to:** • Use service manual • Select tools and equipment • Carry out chassis inspection • Dismantle three-wheel inspection • Repair three-wheel body • Weld three-wheel body	three wheeled body dismounted as per manufacturers guideline	**Knowledge evidence: Detailed knowledge of: Method used:** The student should explain how to: Dismounting three wheeled body **Principles:** The student should explain the principles of:	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available: -** • Motorcycle with three wheeled body • Tool kit • Overall • Safety boots	96

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			students to dismount three wheeled body	• Assemble three-wheel body • Align three-wheel body • Test three-wheel body • Clean tools, equipment and workplace Store and keep tools and equipment		• Dismounting three wheeled body **Theories:** The student should explain: - • Advantages of using service manual • Importance of Dismounting three wheeled body **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions Dismounting three wheeled body. • Handling of tools and equipment • Proper waste disposal	• Motorcycle safety stand • Motorcycle lefts • Safety clear glasses • Gloves • Service manual • Fire extinguisher • Special aligning tools	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
		(b). Repairing three wheeled body	**Discussion:** Guide the student to discuss on how to repair three wheeled body **Demonstration** Demonstrate to the students on how to repairing three wheeled body. **Hands on activity**	**The student should be able to:** • Use service manual • Select tools and equipment • Carry out chassis inspection • Dismantle three-wheel inspection • Repair three-wheel body • Weld three-wheel body	Three wheeled body repaired as per manufacture s guideline	**Knowledge evidence: Detailed knowledge of: Method used:** The student should explain how to: Repair three wheeled body **Principles:** The student should explain the	• Motorcycle with three wheeled body • Tool kit • Overall • Safety boots • Motorcycle safety stand • Motorcycle lefts • Safety clear glasses • Gloves • Service manual	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			Organise the students to repair three wheeled body	• Assemble three-wheel body • Align three-wheel body • Test three-wheel body • Clean tools, equipment and workplace Store and keep tools and equipment		principles of: Repairing three wheeled body **Theories:** The student should explain: - Advantages of Repairing three wheeled body **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while servicing three wheeled body. • Handling of tools and equipment • Waste disposal	• Special aligning tools	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
		2.1.3. Mounting three wheeled body	**Discussion:** Guide the student to discuss on how to Mount three wheeled body **Demonstration** Demonstrate to the students on Mounting three wheeled body **Hands on Activity**	**The student should be able to:** • Use service manual • Select tools and equipment • Carry out chassis inspection • Dismantle three-wheel inspection • Repair three-wheel body • Weld three-wheel	Three wheeled body mounts as per manufactures	**Knowledge evidence: Detailed knowledge of: Method used:** The student should explain how to: Mount three wheeled body **Principles:** The student should explain the	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available: -** • Motorcycle with three wheeled body • Tool kit	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			Organise the students to Mount three wheeled body	body • Assemble three-wheel body • Align three-wheel body • Test three-wheel body • Clean tools, equipment and workplace • Store and keep tools and equipment		principles of: Mounting three wheeled body **Theories:** The student should explain: - • Advantages of using service manual • Types of Mounts three wheeled body • Importance of using safety gears **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while servicing three wheeled body. • Handling of tools and equipment	• Overall • Safety boots • Motorcycle safety stand • Motorcycle lefts • Safety clear glasses • Gloves • Service manual • Special aligning tools	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
						• Waste disposal		
		2.1.4. Aligning three wheeled body	**Discussions:** Guide the student to discuss on how to Align three wheeled body and advantages of using service manual **Demonstration** Demonstrate to the students on aligning three	**The student should be able to:** • Use service manual • Select tools and equipment • Carry out chassis inspection • Dismantle three-wheel inspection • Repair three-wheel body • Weld three-wheel	three wheeled body aligned as per manufacturers	**Knowledge evidence: Detailed knowledge of: Method used:** The student should explain how to: Align three wheeled body **Principles:** The student should	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available: -** • Motorcycle with three wheeled body • Tool kit	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			wheeled body **Hands on Activity** Organise the students to perform aligning three wheeled body	body • Assemble three-wheel body • Align three-wheel body • Test three-wheel body • Clean tools, equipment and workplace Store and keep tools and equipment		explain the principles of: Aligning three wheeled body **Theories:** The student should explain: - • Advantages of using service manual • Importance of aligning three-wheel body **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while servicing three wheeled body. • Handling of tools and equipment • Waste disposal	• Overall • Safety boots • Motorcycle safety stand • Motorcycle lefts • Safety clear glasses • Gloves • Service manual • Special aligning tools	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
	2.2. Carrying out side car body maintenance	(a) Dismounting sidecar body	**Discussion:** Guide the student to discuss on types of side car body and how to dismount sidecar body **Demonstration** Demonstrate to the students on dismounting sidecar body	**The student should be able to:** • Interpret service manual • Select tools and equipment • Observe safety precautions • Inspect sidecar body and frame components • Adjust wheel foe in and lean out		**Knowledge evidence: Detailed knowledge of: Method used:** The student should explain how to: •Dismount side car body **Principles:** The student should explain the	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available: -** • Motorcycle with sidecar body • Tool kit • Chassis special	96

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			Hands on Activity Organise the students to Dismount sidecar body	• Dismantle side car frame and body • Repair side car body and frame • Install side car frame and body • Maintain side car axles • Adjust wheel to aim and lean out • Test performance of riding side car • Clean tools, equipment and workplace • Store and keep tools and equipment		principles of: • Dismounting sidecar body **Theories: The student should** explain: - • Different types of motorcycle side car body. dismounting sidecar body **Circumstantial knowledge** **Detailed knowledge about:** Safety precautions while servicing side car body	tool kit • Motorcycle lift • Motorcycle safety stand • Gloves • Overall • Safety clear glasses • Safety boot	
		(b) Repairing sidecar body	**Discussions:** Guide the student to discuss on Importance of repairing sidecar body, using	**The student should be able to:** • Interpret service manual • Select tools and equipment	Sidecar body repaired as per manufacturers	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should	**This element can be achieved at a work place or in a training institution. The following tools, equipment and**	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			service manual, types of sidecar body repair, and how to repair sidecar body. **Demonstration** Demonstrate to the students on repairing sidecar body **Hands on Activity** Organise the students to repair sidecar body	• Observe safety precautions • Inspect sidecar body and frame components • Adjust wheel foe in and lean out • Dismantle side car frame and body • Repair side car body and frame • Install side car frame and body • Maintain side car axles • Adjust wheel to aim and lean out • Test performance of riding side car • Clean tools, equipment and workplace Store and keep tools and equipment		explain how to: Repair sidecar body Principles: The student should explain the principles of: • Repairing sidecar body car body **Theories**: The student should explain: - • Different types sidecar body repair •Importance of repairing sidecar body **Circumstantial knowledge** **Detailed knowledge about:** Safety precautions while repairing sidecar body	**safety gears are to be available: -** • Motorcycle with sidecar body • Tool kit • Chassis special tool kit • Motorcycle lift • Motorcycle safety stand • Gloves • Overall • Safety clear glasses • Safety boot	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
		(c) Mounting sidecar body	**Discussions:** Guide the students to discuss on how to Mount sidecar body and the importance of using service manual **Demonstration** Demonstrate to the students on Mounting sidecar body **Hands on Activity** Organise the students to Mount sidecar body	**The student should be able to:** • Interpret service manual • Select tools and equipment • Observe safety precautions • Inspect sidecar body and frame components • Adjust wheel foe in and lean out • Dismantle side car frame and body • Repair side car body and frame • Install side car frame and body • Maintain side car axles • Adjust wheel to aim and lean out • Test performance of riding side car	sidecar body mounted as per manufactures	**Knowledge evidence: Detailed knowledge of: Method used:** The student should explain how to Mount sidecar body : **Principles: The student should explain the** principles of: Mounting sidecar body **Theories: The student should explain: -** •Importance of using service manual •Importance of using safety gears **Circumstantial**	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available: -** • Motorcycle with sidecar body • Tool kit • Chassis special tool kit • Motorcycle lift • Motorcycle safety stand • Gloves • Overall • Safety clear glasses • Safety boot	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
				• Clean tools, equipment and workplace • Store and keep tools and equipment		**knowledge** Detailed knowledge about: •Safety precautions while servicing side car body and frames.		
		(d) Aligning sidecar body	**Discussions:** Guide the student to discuss on how to align sidecar body and the importance of using service manual. **Demonstration** Demonstrate to the students on aligning sidecar body **Hands on Activity** Organise the students to Align	**The student should be able to:** • Interpret service manual • Select tools and equipment • Observe safety precautions • Inspect sidecar body and frame components • Adjust wheel foe in and lean out • Dismantle side car frame and body • Repair side car body and frame • Install side car frame and body	sidecar body aligned as per manufacturers guidelines	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to: Aligning sidecar body **Principles**: The student should explain the principles of: Aligning sidecar body **Theories: The student should explain**: -	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available: -** • Motorcycle with sidecar body • Tool kit • Chassis special tool kit • Motorcycle lift • Motorcycle safety stand • Gloves • Overall • Safety clear	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			sidecar body	• Maintain side car axles • Adjust wheel to aim and lean out • Test performance of riding side car • Clean tools, equipment and workplace Store and keep tools and equipment		• Different types Aligning sidecar body •Importance of using service manual **Circumstantial knowledge** **Detailed knowledge about:** Safety precautions while servicing side car body and frame services	glasses • Safety boot • Service Manual	
	2.3. Maintaining motorcycle chassis	(a). Dismounting motorcycle chassis components	**Discussions** Guide the student to discuss on how to dismount motorcycle chassis components. **Demonstration** demonstrate to the students on	**The student should be able to:** • Interpret service manual • Inspect chassis • Dismount motorcycle chassis components • Repair motorcycle chassis • Mount motorcycle	Motorcycle chassis components dismounted as per manufacturers guidelines	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to: Dismount motorcycle chassis components **Principles:** The	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available: -** • Motorcycle with chassis	96

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				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			dismounting motorcycle chassis **Hand on Activity** Organise the students to perform dismounting of motorcycle chassis	chassis components • Align swing arm • Clean tools, equipment and workplace • Store and keep tools and equipment		student should explain the principles of: Dismounting motorcycle chassis components **Theories:** The student should explain: - Importance of dismounting motorcycle chassis components **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while dismounting motorcycle chassis components • Safe handling of tools and	components • Tool kit • Acetylene and oxygen cylinder • Arc welding machines • Special chassis tools kit • Motorcycle safe stand • Helmet • Gloves • Safety clear glasses • Mask • Overall • Service Manual	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
						equipment • Proper waste disposal		
		(b). Checking motorcycle chassis	**Discussions:** Guide the student to discuss on how to Check motorcycle chassis and usage of service manual. **Demonstration** Demonstrate to the students on Checking motorcycle chassis **Hands on Activity** Organise the students to Check motorcycle chassis	**The student should be able to:** • Interpret service manual • Inspect chassis • Dismount motorcycle chassis components • Repair motorcycle chassis • Mount motorcycle chassis components • Align swing arm • Clean tools, equipment and workplace • Store and keep tools and equipment	Motorcycle chassis checked as per manufacturers guidelines	**Knowledge evidence: Detailed knowledge of: Method used:** The student should explain how to: Check motorcycle chassis **Principles:** The student should explain the principles of: Checking motorcycle chassis. **Theories:** The student should explain: - Function of motorcycle chassis and importance of	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available: -** • Tool kit • Motorcycle with chassis • Special chassis tools kit • Motorcycle safe stand • Helmet • Gloves • Safety clear glasses • Mask • Overall	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
						using the service manual. **Circumstantial knowledge** **Detailed knowledge about:** Safety precautions while Checking motorcycle chassis, Proper waste disposal	• Service Manual	
		(c). Repairing motorcycle chassis	**Discussions:** Guide the student to discuss how to Repair motorcycle chassis and to interpret service manual. **Demonstration** Demonstrate to the students on Repairing motorcycle chassis	**The student should be able to:** • Interpret service manual • Inspect chassis • Dismount motorcycle chassis components • Repair motorcycle chassis • Mount motorcycle chassis components • Align swing arm • Clean tools, equipment and	Motorcycle chassis repaired as per manufacturers guidelines	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to: Repairing motorcycle chassis **Principles:** The student should explain the principles of:	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available: -** • Motorcycle with chassis • Tool kit • Acetylene and oxygen cylinder • Arc welding	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			Hand on Activity Organise the students to Repair motorcycle chassis	workplace • Store and keep tools and equipment		Repairing motor cycle chassis **Theories:** The student should explain: - Importance of repairing motorcycle chassis **Circumstantial knowledge Detailed knowledge about:** • Safety precautions while repairing motorcycle chassis sis • Safe handling of tools and equipment • Proper waste disposal	machines • Special chassis tools kit • Motorcycle safe stand • Helmet • Gloves • Safety clear glasses • Mask • Overall • Service Manual	
		(d). Demount motorcycle chassis components	**Discussions:** Guide the student to discuss on how to demount	**The student should be able to:** • Interpret service manual	Motorcycle chassis components demounted	**Knowledge evidence: Detailed knowledge of:**	**This element can be achieved at a work place or in a training institution.**	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			motorcycle chassis components and the importance. **Demonstration** Demonstrate to the students on how to Demount motorcycle chassis components **Hands on Activity** Organise the students to Demount motorcycle chassis components	• Inspect chassis • Mount motorcycle chassis components • Align swing arm • Clean tools, equipment and workplace • Store and keep tools and equipment	as per manufacturers guidelines	**Method used:** The student should explain how to: Demount motorcycle chassis components **Principles:** The student should explain the principles of: Demounting motorcycle chassis components . **Theories:** The student should explain: - • Importance of demounting motorcycle chassis components **Circumstantial knowledge** **Detailed knowledge about:**	**The following tools, equipment and safety gears are to be available: -** • Motorcycle with chassis components • Tool kit • Acetylene and oxygen cylinder • Arc welding machines • Special chassis tools kit • Motorcycle safe stand • Helmet • Gloves • Safety clear glasses • Mask • Overall • Service Manual	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
						• Safety precautions while demount motorcycle chassis components • Safe handling of tools and equipment • Proper waste disposal		
3.0 Maintaining brake system	3.1. Maintaining front disc brake	(a). Servicing disk brake components	**Discussions:** Guide the student to discuss on how to Service disk brake components, characteristics of brake fluid and importance of testing brake performance **Demonstration** Demonstrate to the students on	**The student should be able to:** • Use service manual • Select tools and equipment • Inspect brake components • Top up brake fluid • Bleed air from brake lines • Repair brake calliper and pad • Repair front master cylinder	Disk brake components serviced as per manufacturers guidelines	**Knowledge evidence: Detailed knowledge of: Method used:** The student should explain how to: Service disk brake components **Principles:** The student should explain the principles of: Servicing disk brake	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available: -** • Motorcycle with disk brake components • Tool kit • Brake fluid • Disc brake pad	55

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			Servicing disk brake components **Hand on Activity** Organise the students to Service disk brake components	• Test brake performance • Clean tools, equipment and workplace • Store and keep tools and equipment		components **Theories:** The student should explain: - • Importance of Servicing disk brake components • Characteristics of brake fluid • Importance of testing brake performance **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while servicing front brake disc • Safe handling of tools and equipment	• Caliper service tool kit • Brake bleeder • Bleed hose pipe • Fluid container • Motorcycle safety stand • Motorcycle lift/hoist • Gloves • Safety clear glasses	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
						• Proper waste disposal		
		(b) Servicing disk brake components	**Discussions:** Guide the student to discuss on servicing disk brake components and importance of testing brake performance **Demonstration** Demonstrate to the students on Servicing disk brake components and testing brake performance. **Hands on Activity** Organise the students to Servicing disk brake components.	**The student should be able to:** • Use service manual • Select tools and equipment • Inspect brake components • Top up brake fluid • Bleed air from brake lines • Repair brake caliper and pad • Repair front master cylinder • Test brake performance • Clean tools, equipment and workplace Store and keep tools and equipment	Disc brake components repaired as per manufacturers guidelines	**Knowledge evidence: Detailed knowledge of: Method used:** The student should explain how to: Service disk brake components **Principles:** The student should explain the principles of: Servicing disk brake components **Theories:** The student should explain: - Importance of testing brake performance **Circumstantial knowledge Detailed**	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available: -** • Motorcycle with disk brake • Tool kit • Disc brake pad • Caliper service tool kit • Brake bleeder • Bleed hose pipe • Fluid container • Motorcycle safety stand • Motorcycle lift/hoist • Gloves	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
						knowledge about: • Safety precautions while Servicing disk brake components • Safe handling of tools and equipment • Proper waste disposal	• Safety clear glasses	
	3.2. Performing front brake cable maintenance	(a). Adjusting brake cable	**Discussions:** Guide the student to discuss on how to Adjust brake cable **Demonstration** Demonstrate to the students on Adjusting brake cable **Hands on Activity** Organise the students to Adjust	**The student should be able to:** • Use service manual • Select tools and equipment • Inspect cable components • Inspect brake • Repair brake cable components • Test brake performance • Clean tools, equipment and	Brake cable adjusted as per manufacturers guidelines	**Knowledge evidence: Detailed knowledge of: Method used:** The student should explain how to: Adjust brake cable **Principles:** The student should explain the principles of: Adjusting brake cable	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available: -** • Motorcycle with cable brake • Tool kit • Motorcycle stands/hoist • Gloves	55

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			brake cable	workplace • Store and keep tools and equipment		**Theories:** The student should explain: - Operation of brake cable and adjusting brake cable. **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while performing brake cable adjusting • Safe handling of tools and equipment • Proper waste disposal	• Overall • Safety clear glasses • Helmet • Safety boots • Service Manual	
		(b). Repairing brake cable	**Discussiions:** Guide the student to discuss on how to Repair brake cable	**The student should be able to:** • Use service manual • Select tools and equipment	Brake cable repaired as per manufacturers guidelines	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The	**This element can be achieved at a work place or in a training institution. The following tools,**	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			Demonstration Demonstrate to the students on Repairing cable brake **Hands on Activity** Organise the students to Repairing cable brake	• Inspect cable components • Inspect brake • Repair brake cable components • Test brake performance • Clean tools, equipment and workplace • Store and keep tools and equipment		student should explain how to: Repair cable brake **Principles:** The student should explain the principles of: Repairing cable brake **Theories:** The student should explain: - • Operation of brake cable • Importance of carrying out brake cable inspection **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while repairing brake cable	**equipment and safety gears are to be available: -** • Motorcycle with cable brake • Tool kit • Motorcycle stands/hoist • Gloves • Overall • Safety clear glasses • Helmet • Safety boots • Service Manual	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
						• Safe handling of tools and equipment Proper waste disposal		
	3.3. Maintaining drum brake	(a). Adjusting brake linkages	**Discission:** Guide the student to discus how to Adjust brake linkages and Impotence of adjusting brake linkages **Demonstrations** Demonstrate to the students on Adjusting brake linkages **Hands on Activity** Organise the students to Adjust brake linkages	**The student should be able to:** • Use service manual • Select tools and equipment • Adjusting brake linkages • Test brake performance • Clean tools, equipment and workplace • Store and keep tools and equipment	brake linkages adjusted as per manufacturers guidelines	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to: Adjust brake linkages **Principles:** The student should explain the principles of: Adjusting brake linkages **Theories:** The student should explain: - Impotence of adjusting brake linkages	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available: -** • Motorcycle with brake linkages • • Tool kit • Drum brakes special tool kit • Air compressor • Motorcycle safety stands • Motorcycle lift/hoist	55

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
						Circumstantial knowledge **Detailed knowledge about:** Safety precautions while adjusting brake linkages • Safe handling of tools and equipment Proper waste disposal	• Overall • Helmet • Gloves	
		(b). Repairing drum brake components	**Discussions:** Guide the student to discuss on operation of drum brake, importance of repairing drum brake components and how to Repair drum brake components. **Demonstration** Guide the students	**The student should be able to:** • Use service manual • Select tools and equipment • Inspect drum brake components • Dismount drum brake • Repair drum brake components • Demount drum brake components	Drum brake components repaired as per manufacturers guidelines	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to: Repair drum brake components **Principles:** The student should explain the principles of:	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available: -** • Motorcycle with drum brake components • Tool kit • Drum brakes	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			on Repairing drum brake components **Hands on Activity** Organise the students to Repair drum brake components	• Adjust drum brake mechanisms • Test brake performance • Clean tools, equipment and workplace • Store and keep tools and equipment		Repairing drum brake components **Theories:** The student should explain: - • Operation of drum brake • Importance of repairing drum brake components **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while performing the task • Safe handling of tools and equipment • Waste disposal	special tool kit • Air compressor • Motorcycle safety stands • Motorcycle lift/hoist • Overall • Helmet • Gloves	
4.0.	4.1. Performing	(a) Checking	**Discussions:**	**The student should be**	battery	**Knowledge**	**This element can be**	55

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
Carrying out general maintenance on electrical and electronic systems	battery maintenance	electrolyte level. . .	Guide the student to discuss on function of electrolyte, handling of electrolyte and how to Check electrolyte level. **Demonstration** Demonstrate to the students on Checking electrolyte level **Hands on Activity** Organise the students to Check electrolyte level	**able to:** • Select tools and equipment. • Check battery state of charge • Service battery • Test battery • Observe safety precautions • Clean tools, equipment and work place • Store tools and equipment	maintenance performed as per manufacturers guidelines	**evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to: Check electrolyte level. **Principles:** The student should explain the principles of: Checking electrolyte level. **Theories:** The student should explain: • Function of electrolyte. • Handling of electrolyte **Circumstantial knowledge:** **Detailed knowledge about:**	**achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available: -** • Motorcycle • Battery • Hydrometer • Wire brush • Tool kit • Plastic container • Thermometer • Water sucker • Safety clear glasses Overall	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
						• Safety precautions while checking electrolyte level • Safe handling of tools and equipment. Proper waste disposal		
		(b) Checking state of charge of battery	**Discussions:** Guide the student to discuss on electrolysis process and how to Check state of charge of battery. **Demonstration** Demonstrate to the students on Checking state of charge of battery **Hands on Activity**	**The student should be able to:** • Select tools and equipment. • Remove battery from vehicle. • Check battery state of charge. • Service battery. • Mount battery to vehicle. • Test battery. • Observe safety precautions. • Clean tools,	State of charge of battery checked as per manufacturers guidelines	**Knowledge evidence: Detailed knowledge of: Method used:** The student should explain how to: Check state of charge of battery **Principles:** The student should explain the principles of: Checking state of charge of battery. **Theories:** The	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available: -** • Motorcycle • Battery charger • Hydrometer • High-rate discharge tester • Wire brush • Tool kit	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			Organise the students to Check state of charge of battery	equipment and work place. • Store tools and equipment.		student should explain: Electrolysis process. **Circumstantial knowledge:** **Detailed knowledge about:** • Safety precautions while checking state of charge of battery • Safe handling of tools and equipment Waste disposal	• Multimeter • Plastic container • Thermometer • Water sucker • Safety clear glasses • Overall	
		(c) Performing battery charging	**Discussions:** Guide the student to discuss on types of battery charging and how to Perform battery charging	**The student should be able to:** • Select tools and equipment. • Remove battery from motorcycle. • Check battery state of charge.	Battery charging performed as per manufacturers guidelines	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to: Perform battery	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available: -**	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			Practical work Guide the students on Performing battery charging **Activity** Organise the students to Perform battery charging	• Service battery. • Test battery. • Mount the battery to the motorcycle. • Observe safety precautions. • Clean tools, equipment and work place. • Store tools and equipment.		charging. **Principles:** The student should explain the principles of: Performing battery charging **Theories:** The student should explain: Types of battery charging **Circumstantial knowledge:** **Detailed knowledge about:** • Safety precautions while performing battery charging • Safe handling of tools and equipment • Proper waste disposal	• Motorcycle • Battery charger • High-rate discharge tester • Wire brush • Tool kit • Multimeter • Plastic container • Water sucker • Safety clear glasses • Overall	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
	4.2. Servicing electrical and electronic circuits	(a)Troubleshooting electrical and electronic circuits	**Discussions:** Guide the student to discuss on Possible faults in electrical and electronic circuits, cause and remedies, use of electrical/electronic measuring instruments a and how to troubleshoot electrical and electronic circuits. **Demonstration** Demonstrate to the students on troubleshooting electrical and electronic circuits **Hands on Activity** Organise the	**The student should be able to:** • Interpret electrical and electronic circuit diagrams • Select tools and equipment • Diagnoses electrical and electronic circuit faults • Rectify defective components • Test electrical and electronic circuit • Observe safety precautions • Clean tools, equipment and work place	Electrical and electronic circuits troubleshooting carried out as per manufacturers guidelines	**Knowledge evidence: Detailed knowledge of: Method used:** The student should explain how to: Troubleshoot electrical and electronic circuits **Principles:** The student should explain the principles of troubleshooting electrical and electronic circuits **Theories:** The student should explain: • impotence of troubleshooting electrical and electronic circuits	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available: -** • Motorcycle • Tool kit • Multimeter • Set of different wire connectors • Test lamp • Service manual • Clamp on meter • Hydrometer • High rate discharge tester • Thermometer • Wire brush. • Soldering gun. • Work bench. • AC/DC Generator and	57

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			students to Troubleshoot electrical and electronic circuits			• Possible faults in electrical and electronic circuits cause and remedies **Circumstantial knowledge:** **Detailed knowledge about:** • Safety precautions while troubleshooting electrical and electronic circuits • Safe handling of work tools and equipment. • Proper waste disposal	starter Motor test bench. • Spark plug service machine • Ignition coil tester. • Oscilloscope • Electronic diagnosis equipment/tool • Safety boots • Gloves • Overall	
		(b) Repairing electrical and electronic circuits	**Discussion:** Guide the student to discuss on how to use service manuals,	**The student should be able to:** • Interpret electrical and electronic circuit diagrams	Electrical and electronic circuits repaired as	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The	**This element can be achieved at a work place or in a training institution. The following tools,**	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			application of electrical/electronic measuring instruments and how to Repair electrical and electronic circuits **Demonstrations** Demonstrate to the students on use of electrical/electronic measuring instruments and repairing electrical and electronic circuits **Hands on Activity** Organise the students to Repair electrical and electronic circuits	• Select tools and equipment. • Diagnoses electrical and electronic circuit faults. • Rectify defective components. • Test electrical and electronic circuit. Observe safety precautions	per manufacturers guidelines	student should explain how to: • Repair electrical and electronic circuits • Use service manuals **Principles:** The student should explain the principles of repairing electrical and electronic circuits **Theories:** The student should explain on Use of electrical/electronic measuring instruments. **Circumstantial knowledge:** **Detailed knowledge about:**	**equipment and safety gears are to be available: -** • Motorcycle • Tool kit. • Multimeter. • Set of different wire connectors • Test lamp • Service manual. • Clamp on meter • Wire brush. • Soldering gun • Soldering wire • Work bench. AC/DC Generator and starter Motor test bench • Ignition coil tester • Oscilloscope • Electronic diagnosis equipment/tool.	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
						• Safety precautions while servicing vehicle electrical and electronic circuits. • Safe handling of work tools and equipment. Proper waste disposal		
	4.3 servicing conventional ignition systems	(a) Diagnosing ignition systems	**Discussions:** Guide the student to discuss on types of ignition system, functions of components of the motorcycle ignition system, and how to Diagnose ignition systems. **Demonstrations** Demonstrate to	**The student should be able to:** • Interpret ignition circuit diagrams • Select tools and equipment • Diagnose faults in ignition system circuit • Test ignition system • Observe safety precautions • Clean tools, equipment and work	Ignition systems diagnosis carried out as per manufacturers guidelines	**Knowledge evidence: Detailed knowledge of: Method used:** The student should explain how to: Diagnose ignition systems. **Principles:** The student should explain the principle of: Diagnosing ignition	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available: -** • Motorcycle with ignition coil • Tool kit • Multimeter • Set of different	56

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			the students on Diagnosing ignition systems **Hands on Activity** Organise the students to Diagnose ignition systems	place Store tools and equipment		systems and operation of ignition system. **Theories:** The student should explain: • Types of ignition systems. • Function of ignition system components. **Circumstantial knowledge:** **Detailed knowledge about:** • Safety precautions while working with ignition systems. • Safe handling of work tools and equipment. Waste disposal	wire connectors • Test lamp • Service manual. • Clamp on meter • Hydrometer • High-rate discharge tester • Thermometer • Wire brush. • Soldering gun. • Work bench. • AC/DC Generator and starter Motor test bench	
		(b) Repairing	**Discussions:**	**The student should be**	Ignition	**Knowledge**	**This element can be**	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
		ignition system components	Guide the student to discuss on possible faults in the ignition system, causes and remedies and how to repair ignition system components **Demonstrations** Demonstrate to the students on Repairing ignition system components **Hands on Activity** Organise the students to Repair ignition system components	**able to:** • Interpret ignition circuit diagrams. • Select tools and equipment. • Diagnose faults in ignition system circuit. • Rectify defective components. • Test ignition system. • Observe safety precautions • Clean tools, equipment and work place. Store tools and equipment	system components repaired as per manufacturers guidelines	**evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to: Repairing ignition system components **Principles:** The student should explain the principle of: Repairing ignition system components **Theories:** The student should explain: Possible faults in the ignition system, causes and remedies. **Circumstantial knowledge:** **Detailed knowledge about:** • Safety	**achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available: -** • Motorcycle with ignition system components • Tool kit • Multimeter • Set of different wire connectors • Test lamp • Service manual. • Clamp on meter. • Hydrometer • High rate discharge tester • Thermometer • Wire brush • Soldering gun • Work bench • AC/DC Generator and	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
						precautions while working with ignition systems. • Safe handling of work tools and equipment. Proper waste disposal	starter Motor test bench	
	4.4. Servicing light system	(a). Servicing head light circuit	**Discussions:** Guide the student to discuss on Types of headlight circuit service and how to Service head light circuit **Demonstrations** Demonstrate to the students on Servicing head light circuit **Hands on Activity**	**The student should be able to:** • Interpret lighting circuit diagrams • Use service manual • Select tools and equipment • Checking headlamp . • Observe safety precautions. • Clean tools, equipment and work place. Store tools and equipment	head light circuit serviced as per manufacturers guidelines	**Knowledge evidence: Detailed knowledge of: Method used:** The student should explain to how Service head light circuit **Principles:** The student should explain the principles of: Servicing head light circuit **Theories:** The	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available: -** • Motorcycle with head light circuit • Wire brush • Tool kit • Multimeter • Safety clear glasses • Overall.	55

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			Organise the students to Service head light circuit			student should explain: • Types of headlight circuit service • Possible faults, causes and their remedies of lighting circuit **Circumstantial knowledge:** **Detailed knowledge about:** • Safety precautions while checking lighting systems. • Safe handling of work tools and equipment. Waste disposal	• Plastic gloves • Safety boots • Work bench • Gloves • Respiratory mask • Multimeter • Set of different wire connectors • Test lamp • Service manual • Clamp on meter • Wire brush • Soldering gun • Work bench • AC/DC Generator and starter Motor test bench • Spark plug service machine • Ignition coil tester. • Oscilloscope. • Electronic diagnosis	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
							equipment/tool. • Safety boots. Gloves.	
		(b) Servicing signal turning light and hazard light circuit	**Discussions:** Guide the student to discuss on how to Service signal turning light and hazard light circuit **Demonstration** Demonstrate to the students on Servicing signal turning light and hazard light circuit **Hands on Activity** Organise the students to Service signal turning light and hazard light	**The student should be able to:** • Interpret lighting circuit diagrams • Use service manual. • Select tools and equipment • Checking signal turning and hazard light circuit • Rectify lighting defective components • Observe safety precautions • Clean tools, equipment and work place. Store tools and equipment	Signal turning light and hazard light circuit serviced as per manufacturers guidelines	**Knowledge evidence: Detailed knowledge of: Method used:** The student should explain to how Service signal turning light and hazard light circuit **Principles:** The student should explain the principles of: Servicing signal turning light and hazard light circuit **Theories:** The student should explain: • Functions of turning signal and	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available: -** • Motorcycle with signal turning light and hazard light circuit • Wire brush • Tool kit • Multimeter • Safety clear glasses • Overall • Plastic gloves • Safety boots • Work bench	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			circuit			hazard light circuit • Possible faults, causes and their remedies of lighting systems **Circumstantial knowledge:** **Detailed knowledge about:** • Safety precautions while Servicing signal turning light and hazard light circuit. • Safe handling of work tools and equipment. Waste disposal	• Gloves • Respiratory mask • Multimeter • Set of different wire connectors • Test lamp • Service manual • Clamp on meter • Wire brush • Soldering gun • Work bench • AC/DC Generator and starter Motor test bench • Spark plug service machine • Ignition coil tester • Oscilloscope • Electronic diagnosis equipment/tool • Safety boots • Gloves	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
		(c). Servicing parking light circuit	**Discussions:** Guide the student to discuss on possible faults, causes and their remedies of parking light circuit and how to Service parking light circuit **Demonstration** Demonstrate to the students on Servicing parking light circuit **Hands on Activity** Organise the students to Service parking light circuit	**The student should be able to:** • Interpret lighting circuit diagrams. • Use service manual. • Select tools and equipment. • Checking headlamp • Checking signal turning and hazard light circuit • Checking brake light circuit • Checking parking light circuit • Checking reverse light circuit • Checking LED light. • Checking decorative light • Rectify lighting defective components. • Observe safety precautions.	Parking light circuit serviced as per manufacturers guidelines	**Knowledge evidence: Detailed knowledge of: Method used:** The student should explain to how: Service parking light circuit **Principles:** The student should explain the principles of: Servicing parking light circuit Testing parking light circuit **Theories:** The student should explain: Functions parking light circuit Possible faults, causes and their remedies of parking	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available: -** • Motorcycle with parking light circuit • Wire brush • Tool kit • Multimeter • Safety clear glasses • Overall • Plastic gloves • Safety boots • Work bench • Gloves • Respiratory mask • Multimeter	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
				• Clean tools, equipment and work place. Store tools and equipment.		light circuit **Circumstantial knowledge:** **Detailed knowledge about:** Safety precautions while parking light circuit • Safe handling of work tools and equipment. Proper waste disposal	• Set of different wire connectors • Test lamp • Service manual • Clamp on meter • Wire brush • Soldering gun • Work bench • AC/DC Generator and starter Motor test bench • Spark plug service machine • Ignition coil tester • Oscilloscope • Electronic diagnosis equipment/tool • Safety boots • Gloves	
		(d). Servicing brake light circuit	**Discussions:** Guide the student to discuss on	**The student should be able to:** • Interpret lighting	Brake light circuit serviced as	**Knowledge evidence:** **Detailed**	**This element can be achieved at a work place or in a**	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			how to Service brake light circuit **Demonstration** Demonstrate to the students on Servicing brake light circuit **Hands on Activity** Organise the students to Service brake light circuit	circuit diagrams. • Use service manual. • Select tools and equipment. • Checking brake light circuit • Rectify lighting defective components. • Observe safety precautions. • Clean tools, equipment and work place. Store tools and equipment.	per manufacturers guidelines	**knowledge of:** **Method used:** The student should explain to how brake light circuit Service brake light circuit. **Principles:** The student should explain the principles of: Servicing brake light circuit. **Theories:** The student should explain: • Functions of brake light circuit • Possible faults, causes and their remedies of lighting systems. **Circumstantial knowledge:** **Detailed**	**training institution. The following tools, equipment and safety gears are to be available: -** • Motorcycle with brake light circuit • Wire brush • Tool kit • Multimeter • Safety clear glasses • Overall • Plastic gloves • Safety boots • Work bench • Gloves • Respiratory mask • Multimeter • Set of different wire connectors • Test lamp • Service manual	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
						knowledge about: • Safety precautions while Servicing brake light circuit. • Safe handling of work tools and equipment. • Proper waste disposal	• Clamp on meter • Wire brush • Soldering gun • Work bench • AC/DC Generator and starter Motor test bench • Spark plug service machine • Ignition coil tester • Oscilloscope • Electronic diagnosis equipment/tool • Safety boots • Gloves.	
		(e). Servicing reverse light circuit	**Discussions:** Guide the student to discuss on how to Service reverse light circuit Demonstrations	**The student should be able to:** • Interpret lighting circuit diagrams. • Use service manual. • Select tools and equipment.	Reverse light serviced as per manufacturers guidelines	**Knowledge evidence: Detailed knowledge of: Method used:** The student should explain to how	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to**	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			Demonstrate to the students on Servicing reverse light circuit **Hands on Activity** Organise the students to Service reverse light circuit	• Checking reverse light circuit • Rectify lighting defective components. • Observe safety precautions. • Clean tools, equipment and work place. Store tools and equipment.		Service reverse light circuit **Principles:** The student should explain the principles of: Servicing reverse light circuit. **Theories:** The student should explain: • Possible faults, causes and their remedies of lighting systems. • Impotence of Servicing reverse light circuit **Circumstantial knowledge:** **Detailed knowledge about:** Safety precautions while Servicing reverse light circuit.	**be available: -** • Motorcycle with reverse light circuit • Wire brush • Tool kit • Multimeter • Safety clear glasses • Overall • Plastic gloves • Safety boots • Work benc. • Gloves • Respiratory mask • Multimeter • Set of different wire connectors • Test lamp • Service manual. • Clamp on meter. • Wire brush • Soldering gun • Soldering wire	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
						Safe handling of work tools and equipment. Proper waste disposal	• Work bench • AC/DC Generator and starter Motor test bench • Spark plug service machine • Ignition coil tester • Oscilloscope • Electronic diagnosis equipment/tool • Safety boots • Gloves	
		(f). Servicing LED lights	**Discussions:** Guide the student to discuss on possible faults, causes and their remedies of lighting systems and how to Service LED lights **Demonstrations**	**The student should be able to:** • Interpret lighting circuit diagrams. • Use service manual. • Select tools and equipment. • Checking LED light. • Rectify lighting defective	LED lights serviced as per manufacturers guidelines	**Knowledge evidence: Detailed knowledge of: Method used:** The student should explain to how Service LED lights **Principles:** The student should explain the	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available: -** • Motorcycle with	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			Demonstrate to the students on Servicing LED lights **Hands on Activity** Organise the students to Service LED lights	components. • Observe safety precautions. • Clean tools, equipment and work place. Store tools and equipment		principles of: Servicing LED lights **Theories:** The student should explain: • Impotence of Servicing LED lights • Possible faults, causes and their remedies of lighting systems **Circumstantial knowledge:** **Detailed knowledge about:** • Safety precautions while Servicing LED lights • Safe handling of work tools and equipment Waste disposal	LED lights • Wire brush • Tool kit • Multimeter • Safety clear glasses • Overall • Plastic gloves. • Safety boots • Work bench • Gloves • Respiratory mask • Multimeter • Set of different wire connectors • Test lamp • Service manual. • Clamp on meter • Wire brush • Soldering gun • Work bench • AC/DC Generator and starter Motor test bench.	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
							• Spark plug service achine. • Ignition coil tester • Oscilloscope. • Electronic diagnosis equipment/tool. • Safety boots • Gloves	
	4.5. Servicing accessories circuits and components	(a). Servicing electronic components	**Discussions:** Guide the student to discuss on how to Service electronic components **Demonstrations** demonstrate the students on Servicing electronic components **Hands on Activity**	**The student should be able to:** • Select tools equipment and PPE • Interpret auxiliary circuits circuit diagrams • Use service manual. • Servicing electronic components • Observe safety precautions. • Clean tools, equipment and work place.	Electronic components serviced as per manufacturers guidelines	**Knowledge evidence: Detailed knowledge of: Method used:** Method used: The student should explain to how Service electronic components **Principles:** The student should explain the principles of: Servicing electronic components.	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available: -** • Service manual • Motorcycle with electronic components • Wire brush • Tool kit • Multimeter	55

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			Organise the students to Service electronic components	• Store tools and equipment		**Theories:** The student should explain: • electronic components • Safety precautions of servicing electronic components **Circumstantial knowledge:** **Detailed knowledge about:** • Safety precautions while servicing electronic components • Safe handling of work tools and equipment • Proper waste disposal	• Safety clear glasses • Overall • Plastic gloves. • Safety boots • Work bench • Gloves • Respiratory mask • Multimeter • Set of different wire connectors • Test lamp • Service manual • Clamp on meter • Wire brush • Soldering gun • Work bench • AC/DC Generator and starter Motor test bench. • Oscilloscope • Electronic diagnosis equipment/tool	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
							• Safety boots • Gloves • Overall • Safety boots • Gloves	
5.0 Maintaining emission control system	5.1. Servicing catalytic converter	(a). Inspecting catalytic converter	**Discussions:** Guide the student to discus • Functions of catalytic converter • Types of catalytic converter • Importance of catalytic converter • how to Inspect catalytic converter **Demonstrations** Demonstrate to	**The student should be able to:** • Use service manual • Select tools and equipment • inspect catalytic converter • Clean tools, equipment and work place • Store tools and equipment	catalytic converter inspected as per manufacturers guidelines	**Knowledge evidence: Detailed knowledge of: Method used:** The student should explain how to: Inspect catalytic converter **Principles:** The student should explain the principle of: Inspecting catalytic converter **Theories:** The student should explain: - • Functions of catalytic converter	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available: -** • Motorcycle with catalytic converter • Service Manual • Tool kit • Pipe cutter • Air compressor • Exhaust gas analyzer • Overall • Safety boot	49

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			the students on Inspecting catalytic converter **Hands on Activity** Organise the students to Inspect catalytic converter			• Types of catalytic converter • Importance of catalytic converter **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while inspecting catalytic converter	• Gloves • Safety clear glasses	
		(b). Repairing catalytic converter	**Discussions:** Guide the student to discuss on how to • Repairing catalytic converter • Testing catalytic	**The student should be able to:** • Use service manual • Select tools and equipment • Repair catalytic converter • Test catalytic converter	catalytic converter repaired as per manufacturers guidelines	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to: Repair catalytic converter	• Motorcycle with catalytic converter • Service Manual • Tool kit • Pipe cutter • Air compressor • Exhaust gas	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			converter **Demonstrations** Demonstrate to the students on Repairing catalytic converter **Hands on Activity** Organise the students to Repair catalytic converter	• Replace catalytic converter • Clean tools, equipment and work place • Store tools and equipment		**Principles:** The student should explain the principle of: • Repairing catalytic converter • Testing catalytic converter **Theories:** The student should explain: - Importance of catalytic converter **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while repairing catalytic converter	analyser • Overall • Safety boot • Gloves • Safety clear glasses	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
	5.2. Servicing oxygen sensor	(a). Inspecting oxygen sensor	**Discussions:** Guide the student to discuss on • Functions of oxygen sensor • Importance of Inspecting oxygen sensor • Types of oxygen sensors • how to Inspect oxygen sensor **Demonstrations** Demonstrate to the students on Inspecting oxygen sensor **Hands on Activity** Organise the	**The student should be able to:** • Use service manual • Select tools and equipment • Check oxygen sensor • Replacing oxygen sensor • Testing oxygen sensor • Clean tools, equipment and work place • Store tools and equipment	oxygen sensor inspected as per manufacturers guidelines	**knowledge evidence: Detailed knowledge of**: **Method used:** The student should explain how to: Inspect oxygen sensor **Principles:** The student should explain the principle of: Inspecting oxygen sensor **Theories:** The student should explain: - • Importance of Inspecting oxygen sensor • Functions of oxygen sensor • Types of oxygen sensors **Circumstantial knowledge**	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available: -** • Motorcycle with oxygen sensor • Service Manual • Tool kit • Multimeter • Scan tool • Exhaust gas analyser • Torque wrench • Sensor installation tool • Air compressor • Overall • Safety boot • Gloves • Safety clear glasses	49

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			students to Inspect oxygen sensor			**Detailed knowledge about:** • Safety precautions while inspecting oxygen sensor Proper waste disposal		
		(b). Replacing an oxygen sensor	**Discussions:** Guide the student to discuss on Importance of replacing an oxygen sensor and how to Replace an oxygen sensor **Demonstrations** Demonstrate to the students on replacing an oxygen sensor **Hands on**	**The student should be able to:** • Use service manual • Select tools and equipment • Replacing oxygen sensor • Testing oxygen sensor • Clean tools, equipment and work place • Store tools and equipment	An oxygen sensor replaced as per manufacturers guidelines	**knowledge evidence:** **Detailed knowledge of**: **Method used:** The student should explain how to: Replace an oxygen sensor **Principles:** The student should explain the principle of: Replacing an oxygen sensor **Theories:** The student should	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears should be available: - are to** • Motorcycle with an oxygen sensor • Service Manual • Tool kit • Multimeter • Scan tool • Exhaust gas	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			Activity Organise the students to Replace an oxygen sensor			explain: - Importance of replacing an oxygen sensor **Circumstantial knowledge** **Detailed knowledge about:** Safety precautions while replacing an oxygen sensor Proper waste disposal	analyser • Torque wrench • Sensor installation tool • Air compressor • Overall • Safety boot • Gloves • Safety clear glasses	
	5.3. Repairing exhaust system components	(a). Repairing exhaust system components	**Discussions:** Guide the student to discuss on how to Repair exhaust system components **Demonstrations** Demonstrate to the students on repairing exhaust system components	**The student should be able to:** • Use service manual • Select tools and equipment • Check leakages and damage of exhaust system • Repairing exhaust system components • Clean tools, equipment and work place	exhaust system components repaired as per manufacturers guideline	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to: Repair exhaust system components **Principles:** The student should explain the principles of:	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears should be available: - are to** • Motorcycle with exhaust system components	49

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			Hands on Activity Organise the students to Repair exhaust system components	• Store tools and equipment		Repairing exhaust system components **Theories:** The student should explain: - Importance of repairing exhaust system components **Circumstantial knowledge** **Detailed knowledge about:** Safety precautions while repairing exhaust system components. Proper waste disposal	• Service Manual • Tool kit • Scan tool • Exhaust gas analyser • Pipe cutter • Overall • Safety boot • Safety clear glasses • Gloves	
		(b) Replacing exhaust system components	**Discussions:** Guide the student to discuss on how to Replace exhaust system components **Demonstrations**	**The student should be able to:** • Use service manual • Select tools and equipment • Check leakages and damage of exhaust system	Exhaust system components replaced as per manufacturers guideline	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to: Replace exhaust	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available: -**	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			Demonstrate to the students on Replacing exhaust system components **Hands on Activity** Organise the students to Replace exhaust system components	• Replacing exhaust system components • Replace components • Test components of exhaust system • Clean tools, equipment and work place • Store tools and equipment		system components **Principles:** The student should explain the principles of: Replacing exhaust system components **Theories:** The student should explain: - Importance of replacing exhaust system components **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while replacing exhaust system components • Proper waste disposal	• Motorcycle with exhaust system components • Service Manual • Tool kit • Scan tool • Exhaust gas analyzer • Pipe cutter • Overall • Safety boot • Safety clear glasses • Gloves	

Form Four

Table 6: *Detailed Contents for Form Four*

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
1.0 Carrying out engine repairing	1.1. Dismantling engine	(a). Dismounting engine	**Discussions:** Guide the student to discuss on how to use service manual, dismount motorcycle engine **Interactive simulation and animation** Guide the student through interactive simulation and animation to visualise	The student should be able to: •Use service manual •Select tools and equipment •Disconnect power supply wires from battery •Remove battery •Drain engine oil •Disconnect clutch control cable •Unscrew spark plug	Engine dismounted as per manufacturer's guideline	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to: Dismount motorcycle engine **Principles:** The student should explain the principles of: Dismounting motorcycle engine **Theories:** The student should explain: - Importance of	**This element can be achieved at a work place or in a training institution.** **The following tools, equipment and safety gears are to be available: -** • Motorcycle engine • Tool kit • Motorcycle engine stand • Wire brush • Oil container • Fastener container • Service manual • Gloves • Waste cotton	115

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			performance of dismounting motorcycle engine **Demonstration** Demonstrate to the students on dismounting motorcycle engine **Hands on activity** Organise the students to Dismount motorcycle engine	•Slacken off the engine fastening nuts •Place the engine on motorcycle engine stands •Detach engine parts and work place •Observe safety precautions •Clean tools, equipment and work place •Store tools and equipment		dismounting engine **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while dismounting motorcycle engine • Safe handling of tools and equipment	• Overall • Safety clear glasses • Safety boots • Internet connectivity •	
		(b). Dismantling engine	**Discussions:** Guide the student to	**The student should be able to:**	Engine dismantled as per	**Knowledge evidence:**	• Tool kit • Motorcycle engine stand	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			discuss on how to use service manual and dismantling engine **Interactive simulation and animation** Guide the student through interactive simulation and animation to visualise performance of dismantling motorcycle engine **Demonstration** Demonstrate to the students on dismantling motorcycle engine	•Use service manual •Select tools and equipment •Disconnect power supply wires from battery •Remove battery •Drain engine oil •Disconnect clutch control cable •Unscrew spark plug •Slacken off the engine fastening nuts •Place the engine on motorcycle engine stands •Detach engine parts and work place •Observe safety	manufacturers guideline	**Detailed knowledge of:** **Method used:** The student should explain how to: • Dismantle engine • Check engine parts **Principles:** The student should explain the principles of: Dismantling engine **Theories:** The student should explain: - • Importance of dismantling engine • Importance of testing engine **Circumstantial knowledge** **Detailed knowledge about:**	• Wire brush • Waste cotton • Oil container • Fastener container • Service manual • Gloves • Overall • Safety clear glasses • Safety boots • Tool kit • Internet connectivity	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			Hands on activity Organise the students to Dismount motorcycle engine	precautions •Clean tools, equipment and work place •Store tools and equipment		• Safety precautions while dismantling the engine • Safe handling of tools and equipment		
	1.2. Repairing engine components	(a). Inspecting worn parts	**Discussions:** Guide the student to discuss on importance of using part numbers and inspecting worn parts **Demonstration** Demonstrate to the students on Inspecting worn parts	**The student should be able to:** •Use of service manual •Select tools and equipment •Check worn out parts and components •Order new parts using part number •Replace worn out parts •Assemble	Worn parts inspected as per manufacturers guideline	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to: Inspect worn parts **Principles:** The student should explain the principles of: Inspecting worn parts	**This element can be achieved at a work place or in a training institution.** **The following tools, equipment and safety gears are to be available: -** • Tool kit • Oil can • Service manual • Waste cotton • Kerosene • Motorcycle engine stand	115

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			Hands on activity Organise the students to Inspect worn parts	engine •Adjust valve mechanism •Set engine timing •Test engine performance •Observe safety precautions •Clean tools, equipment and work place •Store tools, parts and equipment		**Theories:** The student should explain: - Importance of using part numbers to order new parts. **Circumstantial knowledge Detailed knowledge about:** • Safety precautions while inspecting worn parts • Safe handling of tools and equipment	• Fastener container • Engine overhauling tool kit • Gloves • Safety boots • Overall • Safety clear glasses	
		(b) Replacing worn parts	**Discussions:** Guide the student to discuss on replacing worn	**The student should be able to:** •Use of service manual	Worn parts replaced as per manufacturers guideline	**Knowledge evidence: Detailed knowledge of:** **Method used:** The	**This element can be achieved at a work place or in a training institution. The following tools,**	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			parts **Demonstration** Demonstrate to the students on Replacing worn parts **Hands on activity** Organise the students to Replace worn parts	•Select tools and equipment •Check worn out parts and components •Order new parts using part number •Replace worn out parts •Assemble engine •Adjust valve mechanism •Set engine timing •Test engine performance •Observe safety precautions •Clean tools, equipment and work place •Store tools, parts and equipment		student should explain how to: Replace worn parts of engine **Principles:** The student should explain the principles of: Replacing worn parts of engine **Theories:** The student should explain: - Importance of using part numbers to order new parts. **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while replacing worn parts • Safe handling of tools and	**equipment and safety gears are to be available: -** • Tool kit • Oil can • Service manual • New parts • Waste cotton • Kerosene • Motorcycle engine stand • Fastener container • Service manual • Engine overhauling tool kit • Gloves • Safety boots • Overall • Safety clear glasses	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
						equipment		
2.0 Repairing transmission system	2.1. Carrying out gear box dismantling	(a). Dismounting gear box	**Discussions:** Guide the student to discuss on how to Dismount gear box **Interactive simulation and animation** Guide the student through interactive simulation and animation to visualise performance of dismounting gear box **Demonstration** Demonstrate to the students on Dismounting	**The student should be able to:** • Use service manual • Select tools and equipment • Dismount gear box • Clean gear box • Detach parts of gear box • Check gear box worn out components • Clean tools, equipment and work place • Store tools,	Gear box dismounted as per manufacturers guideline	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to: Dismount motorcycle gear box **Principles:** The student should explain the principles of: Dismounting gear box **Theories:** The student should explain: - • checking gear box • Importance of testing gear box • Importance of	**This element can be achieved at a work place or in a training institution.** **The following tools, equipment and safety gears are to be available: -** • Motorcycle with gearbox • Service manual • Tool kit • Waste cotton • Measuring tools • Air compressor • Transmission pressure tester • Snap ring pliers • Overall • Safety boots • Gloves • Safety clear glasses	117

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			gear box **Hands on activity** Organise the students to Dismount gear box	parts and equipment		observing safety precaution **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while dismounting gear box • Safe handling of tools and equipment	• Toque wrench • Cotton waste. • Kerosene • Oil • Internet connectivity	
		(a) Dismantling gear box	**Discussions:** Guide the student to discuss on how to Dismantle gear box	**The student should be able to:** • Use service manual • Select tools and equipment	gear box dismantled as per manufacturers guideline	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to: • Dismantle	**This element can be achieved at a work place or in a training institution.** **The following tools, equipment and safety gears are to be available: -**	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			Interactive simulation and animation Guide the student through interactive simulation and animation to visualise performance of dismantling gear box **Demonstration** Demonstrate to the students on Dismantling gear box **Hands on activity** Organise the students to Dismantle gear box	• Dismount gear box • Clean gear • Check gear box worn out components • Repair components • Clean tools, equipment and work place Store tools, parts and equipment		motorcycle gear box • Check gear box parts **Principles:** The student should explain the principles of: dismantling the gear box **Theories:** The student should explain: - • Importance of dismantling gear box • Importance of testing gearbox • Importance of observing safety precaution **Circumstantial knowledge** **Detailed knowledge about:** • Safety	• Service manual • Waste cotton • Tool kit • Kerosene • Measuring tools • Air compressor • Transmission pressure tester • Snap ring pliers • Overall • Safety boots • Gloves • Safety clear glasses • Gear box • Internet connectivity	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
						precautions while dismantling the gearbox • Safe handling of tools and equipment		
	2.2. Carrying out repair of gear box	(a). Inspecting worn parts	**Discussions:** Guide the student to discuss on how to Inspect worn parts **Demonstration** Demonstrate to the students on Inspecting worn parts **Hands on activity** Organise the	**The student should be able to:** • Use service manual • Select tools and equipment • Check gear box components • Clean gear box • Dismantle gear box	Inspecting worn parts inspected as per manufacturers guideline	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to: Inspect gearbox worn parts **Principles:** The student should explain the principles of: Inspecting worn out parts **Theories:** The	**This element can be achieved at a work place or in a training institution.** **The following tools, equipment and safety gears are to be available: -** • Service manual • Tool kit • Gearbox oil • Kerosene • Waste cotton • Gearbox • Repair parts for gear	117

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			students to Inspect worn parts	• Assemble gear box • Clean tools, equipment and work place Store tools, parts and equipment		student should explain: - Importance of inspecting gearbox worn parts. **Circumstantial knowledge** **Detailed knowledge about:** Safety precautions while inspecting gearbox worn parts components Safe handling of tools and equipment	box • Measuring tools • Air compressor • Transmission pressure tester • Snap ring pliers • Overall • Safety boots • Gloves • Safety clear glasses	
		(b) Replacing worn parts	**Discussions:** Guide the student to discuss on how to replace worn parts **Demonstration** Demonstrate to the students on Replacing worn	**The student should be able to:** • Use service manual • Select tools and equipment • Check gear box components	Worn parts replaced as per manufacturers guidelines	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to: Replace worn parts of the gearbox **Principles:** The student should	**This element can be achieved at a work place or in a training institution.** **The following tools, equipment and safety gears are to be available: -** • Service manual • Tool kit	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			parts **Hands on activity** Organise the students to Replace worn parts	• Clean gear box • Dismantle gear box • Repair gear box • Assemble gear box • Test gear box • Clean tools, equipment and work place Store tools, parts and equipment		explain the principles of: • Ordering new parts • Replacing worn parts **Theories:** The student should explain: - Importance of replacing worn parts. **Circumstantial knowledge** **Detailed knowledge about:** Safety precautions while replacing worn parts Safe handling of tools and equipment	• Waste cotton • Kerosene • New parts for gear box • Measuring tools • Air compressor • Transmission pressure tester • Snap ring pliers • Overall • Safety boots • Gloves • Safety clear glasses	
3.0. Managing safe work environment	3.1. Managing hazards	(a). Controlling mechanical hazards	**Discussions:** Guide the student to discuss on	**The student should be able to:** • Interpret	Mechanical hazards controlled as per OHS guidelines	**Knowledge evidence:** **Detailed knowledge of:**	**This element can be achieved at a work place or in a training institution.**	90

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			how to Control mechanical hazards **Interactive simulation and animation** Guide the student through interactive simulation and animation to visualise performance of controlling mechanical hazards **Hands on activity** Organise the students to Control mechanical hazards	service manuals • Select tools and equipment • Use OSHA rules and regulations • Prepare workshop inspection report • Prepare workshop colour code and safety signs • Identify any safety hazard materials • Handle hazards material • Prepare preventive maintenanc		**Method used:** The student should explain how to: - Control mechanical hazards **Principles:** The student should explain the principles of: Controlling mechanical hazards • **Theories:** The student should explain: - • The meaning of mechanical hazards • Importance of posting warning sign and safety instructions • Advantages of risk assessment • Importance of monitor safety at working place	**The following tools, equipment and safety gears are to be available: -** • Electrical equipment • Machine guarding • Mechanical equipment • Measuring tools • Cutting tools • Service manuals • OSHA rules and regulations • Gloves • Ear plug • Mask	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
				e schedule • Identify and apply all emergency equipment and supplies • Conduct safety awareness training to sub-ordinates • Monitor safety environment • Manage uses of safety gears • Cleaning tools and equipment • Storing tools and equipment		**Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while managing mechanical hazards • Safe handling of tools and equipment		

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
		(b) Controlling chemical hazards	**Discussions:** Guide the student to discuss on how to Control chemical hazards. **Interactive simulation and animation** Guide the student through interactive simulation and animation to visualise performance of controlling chemical hazards **Demonstration** Demonstrate to the students on	**The student should be able to:** • Interpret service manuals • Select tools and equipment • Use OSHA rules and regulations • Prepare workshop inspection report • Prepare workshop colour code and safety signs • Identify any safety hazard materials	Chemical hazards controlled as per OHS guidelines	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to: - Control chemical hazards **Principles:** The student should explain the principles of: Controlling chemical hazards **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while controlling chemical hazards	**This element can be achieved at a work place or in a training institution.** **The following tools, equipment and safety gears are to be available: -** • Electrical equipment • Measuring tools • Lebel for hazardous material • Cutting tools • First aid kit • Fire extinguishers • Service manuals OSHA rules and • regulations • Gloves • Ear plug • Mask • Internet	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			Controlling chemical hazards **Hands on activity** Organise the students to Control chemical hazards	• Handle hazards material • Prepare preventive maintenance schedule • Identify and apply all emergency equipment and supplies • Conduct safety awareness training to sub-ordinates • Manage uses of safety gears • Cleaning tools and equipment • Storing tools and equipment		• Safe handling of tools and equipment	connectivity	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
		(c) Controlling Physical hazards	**Discussions:** Guide the student to discuss on how to Control Physical hazards **Demonstration** Demonstrate to the students on Controlling Physical hazards **Hands on activity** Organise the students to Control Physical hazards	**The student should be able to:** • Interpret service manuals • Select tools and equipment • Use OSHA rules and regulations • Prepare workshop inspection report • Prepare workshop colour code and safety signs • Identify any	Physical hazards controlled as per OHSA guidelines	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to: - Controlling Physical hazards **Principles:** The student should explain the principles of: Controlling Physical hazards **Theories:** The student should explain: - • Function of inspection check list • Importance of posting warning	**This element can be achieved at a work place or in a training institution.** **The following tools, equipment and safety gears are to be available: -** • Electrical equipment • Mechanical equipment • Power machines • Measuring tools • Cutting tools • First aid kit • Fire extinguishers • Service manuals OSHA rules and • regulations • Helmet	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
				safety hazard materials • Handle hazards material • Prepare preventive maintenance schedule • Identify and apply all emergency equipment and supplies • Conduct safety awareness training to sub-ordinates • Manage uses of safety gears • Cleaning tools and equipment		sign and safety instructions • Importance of monitor safety at working place **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while Controlling Physical hazards • Safe handling of tools and equipment • Waste disposal	• Gloves • Ear plug • Mask • Gloves	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
				• Storing tools and equipment				
	3.2. Carrying out risk assessment	(a) Controlling risk	**Discussions:** Guide the student to discuss on how to Control risk and sensitise awareness **Demonstration** Demonstrate to the students on Controlling risk **Hands on activity** Organise the students to control risk	**The student should be able to:** •Interpret service manuals •Select tools and equipment •Supervise practice safe workshop practices to protect yourself, other and properties •React correctly and safely when faced with an emergency •Identify and apply correctly all emergency equipment and	Risk controlled as per OHS guidelines	**Knowledge evidence: Detailed knowledge of:** **Method used:** The student should explain how to: • Control risk • Identify risks **Principles:** The student should explain the principles of: Controlling risk **Theories:** The student should explain: - • Impotence of controlling risk • Inspecting workshop areas	**This element can be achieved at a work place or in a training institution. The following tools, equipment and safety gears are to be available: -** • Service manuals • OSHA regulations • Workshop rules • Camera • Risk assessment sheet • Mask • Ear plug • Gloves • Overall	90

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
				supplies •Make periodic inspections of workshop area and all equipment and prepare report •Conduct safety training •Identify any safety hazard material •Handle hazard material correctly •Prepare universal workshop colour codes and know what the colour represents •Make out and file safe report •Be aware of the dangerous of compressed air •Ensure		tools and equipment **Circumstantial knowledge** **Detailed knowledge about:** Safety precautions while controlling risk Safe handling of tools and equipment		

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
				availability of personal protective equipment •Supervise compressed air rules •Monitor good environmental practices •Clean tools and equipment •Store tools and equipment				
		(b) Managing safety gears	**Discussions:** Guide the student to discuss on how to Manage safety gears **Demonstration** Demonstrate to the students on Managing safety gears	**The student should be able to:** •Interpret service manuals •Select tools and equipment •Supervise practice safe workshop practices to protect yourself,	Safety gears managed as per OHS guidelines	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to: Manage safety gears **Principles:** The student should explain the principles of:	**This element can be achieved at a work place or in a training institution.** **The following tools, equipment and safety gears are to be available: -** • Service manuals • OSHA regulations • Workshop rules	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			Hands on activity Organise the students to Manage safety gears	other and properties •React correctly and safely when faced with an emergency •Identify and apply correctly all emergency equipment and supplies •Make periodic inspections of workshop area and all equipment and prepare report •Conduct safety training •Identify any safety hazard material •Handle hazard material correctly •Prepare universal		Managing safety gears **Theories:** The student should explain: - How to manage workshop safety gears **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while managing safety gears • Safe handling of tools and safety gear.	• Camera • Risk assessment sheet • Mask • Ear plug • Gloves • Overall	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
				workshop colour codes and know what the colour represents •Make out and file safe report •Be aware of the dangerous of compressed air •Ensure availability of personal protective equipment •Supervise compressed air rules •Monitor good environmental practices •Clean tools and equipment •Store tools and equipment				
	3.3. Managing environment	(a). Managing air pollution	**Discussions:** Guide the	**The student should be able**	Air pollution managed as per	**Knowledge evidence:**	**This element can be achieved at a work**	90

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			student to discuss on how to Manage air pollution **Demonstration** Invite guest speaker to demonstrate to the students on Managing air pollution **Hands on activity** Organise the students to Manage air pollution	**to:** •Select relevant safety gears •Prepare preventive maintenance schedule •Control environmental pollution •Maintaining safety environment •Managing safety personal environment •Control tools, equipment and safety gears •Control different types of wastes as per OSHA •Conduct safety awareness training to	OHS guidelines	**Detailed knowledge of:** **Method used:** The student should explain how to: Manage air pollution **Principles:** The student should explain the principles of: Managing air pollution **Theories:** The student should explain: - • Student should explain importance of safe work environment • Explain types of environment pollution • Advantages of monitoring	**place or in a training institution.** **The following tools, equipment and safety gears are to be available: -** • Tool kit • Air pollution control devices • Safety boots • Gloves • Overalls • Cleaning materials • Diagnostic air pollution tools • Proper ventilation system • Safety gears • Guest speaker	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
				subordinates		environmental pollution • Importance of preparing environmental schedule • Importance of control different types of wastes **Circumstantial knowledge** **Detailed knowledge about:** • Safety knowledge while managing environmental pollution • Safe handling of tools and equipment • Proper waste disposal		
		(b). Managing water pollution	**Discussions:** Guide the student to	**The student should be able to:**	Water pollution managed as per OHS guidelines	**Knowledge evidence:** **Detailed knowledge**	**This element can be achieved at a work place or in a training**	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			discuss on how to Manage water pollution **Demonstration** Invite guest speaker to demonstrate to the students on managing water pollution **Hands on activity** Organise the students to Manage water pollution	•Select relevant safety gears •Control environmental pollution •Maintaining safe environment •Managing safety personal environment •Control tools, equipment and safety gears •Control different types of wastes as per OSHA •Conduct safety awareness training to subordinates		**of:** **Method used:** The student should explain how to: Managing water pollution **Principles:** The student should explain the principles of: Managing water pollution Handling **Theories:** The student should explain: - • Advantages of monitoring water pollution • Importance of control different types of wastes **Circumstantial knowledge** **Detailed knowledge about:** • Safety knowledge	**institution.** **The following tools, equipment and safety gears are to be available: -** • Tool kit • Septic tank • Monitoring tool • Wastewater treatment facilities • Safety boots • Gloves • Overalls • Cleaning materials • Safety gears • Guest speaker	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
						while managing environmental pollution • Safe handling of tools and equipment • Waste disposal		
		(c). Managing land pollution	**Discussions:** Guide the student to discuss on how to Manage land pollution **Demonstration** Invite the guest speaker to demonstrate to the students on Managing land pollution **Hands on activity** Organise the	**The student should be able to:** •Select relevant safety gears •Control environmental pollution •Maintaining safe environment •Managing safety personal environment •Control tools, equipment and safety gears	Land pollution managed as per OHS guidelines	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to: Managing land pollution **Principles:** The student should explain the principles of: Managing land pollution **Theories:** The student should explain: -	**This element can be achieved at a work place or in a training institution.** **The following tools, equipment and safety gears are to be available: -** • Drip trays and storage bin • Proper waste disposal • Environmental monitoring equipment • Safety boots • Gloves	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			students to Manage land pollution	•Control different types of wastes as per OSHA •Conduct safety awareness training to subordinates		• Explain types of land pollution • Advantages of monitoring land pollution • Importance of control different types of wastes **Circumstantial knowledge** **Detailed knowledge about:** • Safety knowledge while managing land pollution • Safe handling of tools and equipment • Waste disposal	• Overalls • Cleaning materials • Hoe • Broom • Brush • Safety gears • Guest speaker	
4.0 Managing preventive maintenance	4.1. Planning preventive maintenance	(a). Preparing schedules of preventive maintenance of tools, machines	**Discussions:** Guide the student to discuss on	**The student should be able to:** •Interpret service manuals	Preventive maintenance planned as per workplace requirements	**Knowledge evidence:** **Detailed knowledge of**: **Method used:** The	**This element can be achieved at a work place or in a training institution.** **The following tools,**	38

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
		and equipment	how to Prepare schedules of preventive maintenance of tools, machines and equipment **Demonstration** Demonstrate to the students on Preparing schedules of preventive maintenance of tools, machines and equipment **Hands on activity** Organise the students to Prepare schedules of preventive maintenance of tools, machines and equipment	•Read and apply workshop rules and regulations •Select tools and equipment •Make periodic inspection of workshop area and all equipment. •Prepare workshop inspection report of tools and equipment •Prepare preventive maintenance programmes •Prepare workshop preventive maintenance schedule •Prepare and use workshop colour		student should explain how to: Prepare schedules of preventive maintenance of tools, machines and equipment **Principles:** The student should explain the principles of: Preparing schedules of preventive maintenance of tools, machines and equipment **Theories:** The student should explain: - • Importance of Preparing schedules of preventive maintenance of tools, machines and equipment • Importance of	**equipment and safety gears are to be available: -** • General hand tool kit • Workshop tools, equipment and machines • Service manuals • Workshop rules and regulations • Gloves • Overall • Safety boots • Safety clear glasses	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
				court and safety signs •Plan and Prepare workshop inventory •Clean tools and equipment •Store tools and equipment		Cleaning and storing tools and equipment		
		(b). Preparing inspection check list of tools, equipment and machine	**Discussions:** Guide the student to discuss on how to Prepare inspection check list of tools, equipment and machine **Demonstration** Demonstrate to the students on Preparing inspection check list of tools,	**The student should be able to:** •Interpret service manuals •Read and apply workshop rules and regulations •Select tools and equipment •Make periodic inspection of workshop area and all equipment.	Inspection check list of tools, equipment and machine prepared as per workplace requirements	**Knowledge evidence:** **Detailed knowledge of**: **Method used:** The student should explain how to: Prepare inspection check list of tools , equipment and machine **Principles:** The student should explain the principles of:	**This element can be achieved at a work place or in a training institution.** **The following tools, equipment and safety gears are to be available: -** • General hand tool kit • Workshop tools, equipment and machines • Service manuals	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			equipment and machine **Hands on activity** Organise the students to Prepare inspection check list of tools, equipment and machine	•Prepare workshop inspection report of tools and equipment •Prepare preventive maintenance programmes •Prepare workshop preventive maintenance schedule •Prepare and use workshop colour court and safety signs •Plan and Prepare workshop inventory •Clean tools and equipment •Store tools and equipment		Preparing inspection check list of tools, equipment and machine **Theories:** The student should explain: - • Importance of interpret service manuals • Importance of preparing workshop inspection and maintenance schedule reports **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while planning preventive maintenance • Safe handling of tools and	• Workshop rules and regulations • Gloves • Overall • Safety boots • Safety clear glasses	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
						equipment		
	4.2. Supervising preventive maintenance	(a) Performing preventive maintenance of tools, equipment and machines	**Discussions:** Guide the student to discuss on how to Perform preventive maintenance of tools, equipment and machines **Demonstration** Demonstrate to the students on Performing preventive maintenance of tools, equipment and machines **Hands on activity** Organise the students to Perform	**The student should be able to:** •Interpret service manuals •Read and apply rules and regulations •Prepare and apply workshop inspection report •Prepare and use safety signs and colour code •Prepare and apply workshop preventive maintenance schedule	Preventive maintenance of tools, equipment and machines as per workplace requirements	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to: Perform preventive maintenance of tools, equipment and machines **Principles:** The student should explain the principles of: Performing preventive maintenance of tools, equipment and machines **Theories:** The student should explain: - • Performing	**This element can be achieved at a work place or in a training institution.** **The following tools, equipment and safety gears are to be available: -** • General hand tool kit • Workshop tools, equipment and machines • Service manuals • Workshop rules and regulations • Gloves • Overall • Safety boots • Safety clear glasses • Helmet • Mask	38

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			preventive maintenance of tools, equipment and machines			preventive maintenance of tools, equipment and machines • Importance of preparing and applying preventive maintenance schedule **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while planning preventive maintenance • Safe handling of tools and equipment • Waste disposal	• Ear plug	
		(b) Performing preventive	**Discussions:** Guide the	**The student**	preventive maintenance of	**Knowledge evidence:**	**This element can be achieved at a work**	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
		maintenance of working environment	student to discuss on how to Perform preventive maintenance of working environment **Demonstration** Demonstrate to the students on Performing preventive maintenance of working environment **Hands on activity** Organise the students to Perform preventive maintenance of working environment	**should be able to:** •Interpret service manuals •Read and apply rules and regulations •Prepare and apply workshop inspection report •Prepare and use safety signs and colour code •Prepare and apply workshop preventive maintenance schedule	working environment performed as per OHS guidelines	**Detailed knowledge of:** **Method used:** The student should explain how to: Perform preventive maintenance of working environment **Principles:** The student should explain the principles of: Performing preventive maintenance of working environment **Theories:** The student should explain: - • Importance of Performing preventive maintenance of working environment	**place or in a training institution.** **The following tools, equipment and safety gears are to be available: -** • General hand foot kit • Workshop tools, equipment and machines • Service manuals • Workshop rules and regulations • Gloves • Overall • Safety boots • Safety clear glasses • Helmet • Mask • Ear plug	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
						• Importance of follow good environmental practices **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while performing preventive maintenance of working environment • Safe handling of tools and equipment • Proper waste disposal		
5.0 Troubleshooting motorcycle faults	5.1. Troubleshooting engine faults	(a). Diagnosing engine components	**Discussions:** Guide the student to discuss on how to	**The student should be able to:** •Use service	Engine components diagnosed as per manufacturers guidelines	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The	**This element can be achieved at a work place or in a training institution.** **The following tools,**	30

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			Diagnose engine components **Interactive simulation and animation** Guide the student through interactive simulation and animation to visualise diagnosing engine components **Demonstration** Demonstrate to the students on Diagnosing engine components **Hands on activity** Organise the students to Diagnose engine	manual •Select tools and equipment •Check engine system faults •Rectify engine system faults •Set engine timing •Adjust valves •Test engine •Clean tools, equipment and work place •Store tools, parts and equipment		student should explain how to: • Diagnosing engine components • **Principles:** The student should explain the principles of: • Diagnosing engine components • electrical faults **Theories:** The student should explain: - Importance of Diagnosing engine components **Circumstantial knowledge** **Detailed knowledge about:** • Diagnosing engine components • Safety	**equipment and safety gears are to be available: -** • Service manual • Tool kit • Scan tool • Timing light • Air compressor • Gloves • Overall • Safety boots • Safety clear glasses • Internet connectivity	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			components			precautions while Diagnosing engine components • Safe handling of tools and equipment • Proper waste disposal		
		(b). Troubleshooting engine systems faults	**Discussions:** Guide the student to discuss on how to Troubleshoot engine systems faults **Interactive simulation and animation** Guide the student through	**The student should be able to:** •Use service manual •Select tools and equipment •Check engine system faults •Rectify engine system faults •Set engine timing	Engine systems troubleshooting carried out as per manufacturers guidelines	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to: Perform Troubleshooting engine systems faults **Principles:** The student should explain the	**This element can be achieved at a work place or in a training institution.** **The following tools, equipment and safety gears are to be available: -** • Service manual • Tool kit • Auto scanner • Timing light • Air compressor	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			interactive simulation and animation to visualise troubleshooting engine systems faults **Demonstration** Demonstrate to the students on Troubleshooting engine systems faults **Hands on activity** Organise the students to Troubleshoot engine systems faults	•Adjust valves •Test engine •Clean tools, equipment and work place •Store tools, parts and equipment		principles of: • Troubleshooting systems faults **Theories:** The student should explain: - • Troubleshooting engine systems faults **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while Troubleshooting engine systems faults • Safe handling of tools and equipment • Proper waste disposal	• Gloves • Overall • Safety boots • Safety clear glasses	
	5.2. Tracing	(a) Diagnosing	**Discussions:**	**The student**	electrical	**Knowledge**	**This element can be**	30

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
	electrical system faults	electrical components	Guide the student to discuss on how to Diagnose electrical components **Interactive simulation and animation** Guide the student through interactive simulation and animation to visualise diagnosing electrical components **Demonstration** Demonstrate to the students on Diagnosing electrical components	**should be able to:** • Use service manual • Select tools and equipment • Identify electrical faults • Replace electrical components • Rectify electrical faults • Test electrical systems • Clean tools, equipment and work place • Store tools, parts and equipment	components diagnosed as per manufacturers guidelines	**evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to: • Diagnose electrical components **Principles:** The student should explain the principles of: • Diagnosing electrical components **Theories:** The student should explain:- • Importance of diagnosing electrical components **Circumstantial knowledge** **Detailed knowledge about:**	**achieved at a work place or in a training institution.** **The following tools, equipment and safety gears are to be available: -** Service manual • Tool kit • Multi meter • Timing light • Tester lamp • Air compressor • Gloves • Overall • Safety boots • Safety clear glasses • Auto scanner	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			Hands on activity Organise the students to Diagnose electrical components			• Safety precautions while diagnosing electrical components • Safe handling of tools and equipment		
		(b). Troubleshooting electrical faults	**Discussions:** Guide the student to discuss on how to troubleshoot electrical faults **Interactive simulation and animation** Guide the student through interactive simulation and animation to	**The student should be able to:** • Use service manual • Select tools and equipment • Identify electrical faults • Replace electrical components • Rectify electrical	Electrical faults carried out as per manufacturers guidelines	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to: Perform Troubleshooting of electrical faults **Principles:** The student should explain the principles of: Troubleshooting electrical faults	**This element can be achieved at a work place or in a training institution.** **The following tools, equipment and safety gears should be available: -** • Service manual • Tool kit • Multimeter • Tester lamp • Timing light • Air compressor	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			visualise troubleshooting electrical faults **Demonstration** Demonstrate to the students on Troubleshooting electrical faults **Hands on activity** Organise the students to Troubleshoot electrical faults	faults • Test electrical systems • Clean tools, equipment and work place • Store tools, parts and equipment		**Theories:** The student should explain: - Tools applied for troubleshooting electrical faults **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while troubleshooting electrical faults • Safe handling of tools and equipment	• Gloves • Overall • Safety boots • Safety clear glasses • Auto scanner • Internet connectivity	
6.0. Managing workshop activities	6.1. Designing workshop layout	(a). Outlining workshop service bay	**Discussions:** Guide the student to discuss on how to outline workshop service bay	**The student should be able to:** •Select tools and equipment. •Plan workshop layout. •Locate different	workshop service bay outlined as per OHS guidelines	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to Outline workshop	**This element can be achieved at a work place or in a training institution.** **The following tools, equipment and safety gears are to be available: -**	35

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			Demonstration Demonstrate to the students on outlining workshop service bay **Hands on activity** Organise the students to outline workshop service bay	workshop sections •Locate the installation of different machines •Identify places for safety gears equipment •Identify convenient place for stores •Identify convenient place to assemble in case of emergency •Mark emergency exit. •Locate information resource Centre •Locate laundry and latrines •Design security system of tools and equipment.		service bay. **Principles:** The student should explain the principles of: outlining workshop service bay **Theories:** The student should explain: Steps to design workshop service bay **Circumstantial knowledge** **Detailed knowledge about:** Safe handling of working tools and equipment.	Organization structures • Different workshop layouts • Overhead projector • Computer • Flip charts • Chalk board. • Different management text books • Handouts • Stationery • Drawing instruments and relevant software. .	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
				•Design safety system to workers •Identify marks and postures •Place sign mark and postures •Label safety precautions for workshop materials and goods				
		(b) Designing layout of light duty equipment	**Discussions:** Guide the student to discuss on how to design layout of light duty equipment **Demonstration** Demonstrate to the students on Designing layout of light duty equipment	**The student should be able to:** •Select tools and equipment •Plan workshop layout •Locate different workshop sections •Locate the installation of different machines	layout of light duty equipment designed in workshop as per OHS guidelines	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to Design layout of light duty equipment. **Principles:** The student should explain the principles of:	**This element can be achieved at a work place or in a training institution.** **The following tools, equipment and safety gears are to be available: -** • Organization structures • Different workshop layouts • Overhead projector	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			using relevant software **Hands on activity** Organise the students to design layout of light duty equipment	•Identify places for safety gears equipment •Identify convenient place for stores. •Identify convenient place to assemble in case of emergency •Mark emergency exit •Locate information resource Centre •Locate laundry and latrines. •Design security system of tools and equipment •Design safety system to workers •Identify marks and postures. •Place sign mark		Designing layout of light duty equipment **Theories:** The student should explain: • Steps to design layout of light duty equipment. • Components applied in workshop safety and security systems. **Circumstantial knowledge** **Detailed knowledge about:** Safety handling of working tools and equipment.	• Computer • Flip charts • Chalk board • Different management text books • Handouts • Stationery • Drawing instruments and relevant software	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
				and postures •Label safety precautions for workshop materials and goods				
		(c) Designing layout of heavy-duty equipment	**Discussions:** Guide the student to discuss on how to design layout of heavy-duty equipment **Demonstration** Demonstrate to the students on Designing layout of heavy-duty equipment **Hands on activity** Organise the students to Design layout of	**The student should be able to:** •Select tools and equipment. •Plan workshop layout. •Locate different workshop sections •Locate the installation of different machines •Identify places for safety gears equipment •Identify convenient place for stores	Layout of heavy-duty equipment designed in workshop as per OHS guidelines	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to Design layout of heavy-duty equipment. **Principles:** The student should explain the principles of: Designing layout of heavy-duty equipment **Theories:** The student should explain:	**This element can be achieved at a work place or in a training institution.** **The following tools, equipment and safety gears are to be available: -** • Organization structures • Different workshop layouts • Overhead projector • Computer • Flip charts • Chalk board. • Different management text books • Handouts	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			heavy-duty equipment	•Identify convenient place to assemble in case of emergency •Mark emergency exit. •Locate information resource Centre •Locate laundry and latrines •Design security system of tools and equipment. •Design safety system to workers •Identify marks and postures •Place sign mark and postures •Label safety precautions for workshop materials and goods		Steps to Designing layout of heavy-duty equipment **Circumstantial knowledge** **Detailed knowledge about:** Safety handling of working tools and equipment	• Stationery • Drawing instruments	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
	6.2. Controlling tools and equipment	(a). Maintaining tools control system	**Discussions:** Guide the student to discuss on how to Maintain tools control system **Demonstration** Demonstrate to the students on Maintaining tools control system **Hands on activity** Organise the students to Maintain tools control system	**The student should be able to:** •Select tools and equipment •Design tools storage system •Keep record of tools and equipment in workshop •Record tools and equipment issued daily from stores •Record tools and equipment received daily from user •Record damaged tools and equipment •Record lost equipment and tools.	Tools control system maintained as per workshop guidelines	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to: Maintaining tools control system. **Principles:** The student should explain the principles of Maintaining tools control system. **Theories:** The student should explain: Identifying different modern methods of Maintaining tools control system. **Circumstantial knowledge** **Detailed knowledge about:**	**This element can be achieved at a work place or in a training institution.** **The following tools, equipment and safety gears are to be available: -** logbook. •Tools and equipment catalogue •Stationeries •Scientific calculator •Staple machine •Binding machine •Tools list •Wall robe •Bench with tool Crip •Toolboxes •Tools issue voucher •Tools ledger •Equipment ledger •Tools inventory list •Files •Overcoat	35

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
				•Discard damaged tools and equipment •Order new tools and equipment		• Safety precautions while maintaining tools control system. • Safe handling of tools and equipment	•Safety boots	
		(b). Taking inventory of tools and equipment	**Discussions:** Guide the student to discuss on how to Take inventory of tools and equipment **Demonstration** Demonstrate to the students on Taking inventory of tools and equipment	**The student should be able to:** •Select tools and equipment •Design tools storage system •Keep record of tools and equipment in workshop. •Record tools and equipment issued daily from store. •Record tools	Inventory of tools and equipment taken as per workshop guidelines	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to: Taking inventory of tools and equipment **Principles:** The student should explain the principles of Taking inventory of tools and equipment. **Theories:** The	**This element can be achieved at a work place or in a training institution.** **The following tools, equipment and safety gears are to be available: -** Skills logbook •Tools and equipment catalogue •Stationeries •Scientific calculator •Staple machine. •Binding machine	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			Hands on activity Organise the students to Take inventory of tools and equipment	and equipment received daily from user •Record damaged tools and equipment •Record lost equipment and tools. •Discard damaged tools and equipment •Order new tools and equipment.		student should explain: **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while Taking inventory of tools and equipment • Safe handling of tools and equipment	•Tools list •Wall robe •Bench with tool Crip •Toolboxes •Tools issue voucher •Tools ledger •Equipment ledger •Tools inventory list •Files •Overcoat •Safety boots	
	6.3. Estimating material and labour cost	(a). Maintaining records of workshop materials	**Discussions:** Guide the student to discuss on how to Maintain records of workshop materials	**The student should be able to:** •Select tools and equipment •Read inspection report •Prepare material cost	Records of workshop materials as per workshop guidelines	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should maintain records of workshop materials **Principles:** The	**This element can be achieved at a work place or in a training institution.** **The following tools, equipment and safety gears are to be available: -**	35

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			Demonstration Demonstrate to the students on Maintaining records of workshop materials **Hands on activity** Organise the students to Maintain records of workshop materials	estimates •Prepare overhead costs •Prepare material request •Prepare quotations and distribute into various shops •Obtain proforma invoice from different shops •Prepare job costing including other overheads		student should explain the principles of: Maintaining records of workshop materials **Theories:** The student should explain: Importance of Maintaining records of workshop materials **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while maintaining records of workshop materials. • Safe handling of materials and documents	List of spares parts. •Materials list •Local purchasing order (LPO) •Calculator/Computer. •Stationeries. •Binding machine. •Material requisition form or (Material requisition voucher (MRV) •Job card •Price list •Good received note (GRN) •Gloves •Overcoat •Safety boot. •Mask	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
		(b). Maintaining man hours/day of workshop staff.	**Discussions:** Guide the student to discuss on how to Maintain man hours/day of workshop staff **Demonstration** Demonstrate to the students on Maintaining man hours/day of workshop staff **Hands on activity** Organise the students to Maintain man hours/day of workshop staff	**The student should be able to**: •Select tools and equipment •Prepare overhead costs •Prepare quotations and distribute into various shops •Prepare job costing including other overheads	Man hours/day of workshop staff maintained as per workshop guidelines	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to Maintain man hours/day of workshop staff. . **Principles:** The student should explain the principles of: Maintaining man hours/day of workshop staff. **Theories:** The student should explain: • Maintaining man hours/day of workshop staff. • Importance of	**This element can be achieved at a work place or in a training institution.** **The following tools, equipment and safety gears are to be available: -** List of spares parts •Materials list •Local purchasing order (LPO) •Calculator/Computer •Stationeries •Binding machine •Material requisition form or •Job card •Good received note (GRN) •Gloves •Overcoat •Safety boot	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
						estimating labour cost. Maintaining man hours/day of workshop staff. **Circumstantial knowledge Detailed knowledge about:** Safety precautions while maintaining man hours/day of workshop staff.		
		(c). Performing job cost calculations	**Discussions:** Guide the student to discuss on how to Perform job cost calculations **Demonstration** Demonstrate to the students on Performing job	**The student should be able to:** •Select tools and equipment. •Read inspection report. •Prepare material cost estimates •Prepare overhead costs	Job cost calculations performed as per workshop guidelines	**Knowledge evidence: Detailed knowledge of: Method used:** The student should explain how to Perform job cost calculations **Principles:** The student should explain the	•List of spares parts •Materials list •Local purchasing order (LPO) •Calculator/Computer •Stationeries •Binding machine •Material requisition form or (Material requisition voucher (MRV) •Job card	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			cost calculations **Hands on activity** Organise the students to Perform job cost calculations	•Prepare material request. •Prepare quotations and distribute into various shops •Obtain proforma invoice from different shops •Prepare job costing including other overheads		principles of: Performing job cost calculations **Theories:** The student should explain: Importance of performing job cost calculations **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while Performing job cost calculations • Safe handling of materials and documents	•Price list •Good received note (GRN) •Gloves •Overcoat •Safety boot •Mask	
	6.4. Training subordinates	(a). Preparing training needs	**Discussions:** Guide the student to	**The student should be able to:**	Training needs prepared as per workshop	**Knowledge evidence:** **Detailed knowledge**	**This element can be achieved at a work place or in a**	35

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			discuss on how to Prepare training needs **Demonstrations** Demonstrate to the students on Preparing training needs **Hands on activity** Organise the students to Prepare training needs	•Select tools and equipment. •Conduct training needs assessment •Prepare capability chart of the subordinates •Identify knowledge and skills to be imparted •Identify previous knowledge and skills possessed by the person to be trained. •Prepare a training programme for the subordinate •Carryout the training programme by using four steps plan	guidelines	**of:** **Method used:** The student should explain how to Preparing training needs **Principles:** The student should explain the principles of carrying out Preparing training needs. **Theories:** The student should explain: • Necessity of identifying previous knowledge and skill of the person to be trained • The importance of step-by-step guidance from simple to	**training institution. The following tools, equipment and safety gears are to be available: -** Workshop •Tool box •Tools •Multimeter. •Workshop machines i.e. -Grinding machine -Drilling machine -Valve grinder -Drum and disc service machine -Wheel balancing machine -Wheel alignment machine/gauge -Head light aiming machine -Testing benches -Bench vices -Anvil -Hydraulic press •Surface block	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
				(prepare, present, try-out, assign work) •Continually assess progress of workers •Make necessary adjustments to the training programme schedule •Clean the work area. •Store tools, equipment, safety gears and other items		complex tasks **Circumstantial knowledge** **Detailed knowledge about:** Preparing training needs	•First aid kit •Firefighting equipment •Emergency exit •Overhead projector •Computer •TV •Organization structure. •Safety gears	
		(b). Carrying out training of subordinates	**Discussions:** Guide the student to discuss on how to Carry out training of subordinates	**The student should be able to:** •Select tools and equipment •Conduct training needs assessment	Training of subordinates carried out as per workshop guidelines	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to . Carry out training of	**This element can be achieved at a work place or in a training institution.** **The following tools, equipment and safety gears are to be available: -**	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			Demonstrations Demonstrate to the students on Carrying out training of subordinates **Hands on activity** Organise the students to Carry out training of subordinates	•Prepare capability chart of the subordinates. •Identify knowledge and skills to be imparted •Identify previous knowledge and skills possessed by the person to be trained. •Prepare a training programme for the subordinate •Carryout the training programme by using four steps plan (prepare, present, try-out, assign work) •Continually assess progress		subordinates. **Principles:** The student should explain the principles of . Carrying out training of subordinates **Theories:** The student should explain: necessity of Carrying out training of subordinates **Circumstantial knowledge** **Detailed knowledge about:** Basic principles of. Carrying out training of subordinates	Workshop •Tool box •Tools •Multimeter •Workshop machines i.e. Drilling machine -Valve grinder -Drum and disc service machine -Wheel balancing machine -Wheel alignment machine/gauge -Head light aiming machine. -Testing benches. -Bench vices -Anvil -Hydraulic press •Surface block •First aid kit •Firefighting equipment •Emergency exit •Overhead projector •Computer •TV	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
				of workers •Make necessary adjustments to the training programme schedule. •Clean the work area. •Store tools, equipment, safety gears and other items.			•Organization structure •Safety gears	
	6.5. Preparing reports	(a) Collecting information	**Discussions:** Guide the student to discuss on how to Collect information **Demonstrations** Demonstrate to the students on Collecting information	**The student should be able to:** •Select tools and equipment. •Collect information. •Write technical reports •Prepare budget report •Prepare action plan	Information collected as per workshop guidelines	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain: How to collect information **Principles:** The student should explain the principles of:	**This element can be achieved at a work place or in a training institution.** **The following tools, equipment and safety gears are to be available: -** Office/table and chairs •Stationery •Computer •Job card •Subordinates	35

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			Hands on activity Organise the students to Collect information	•Keep records		• Collecting information **Theories:** The student should explain: • Importance of Collecting information **Circumstantial knowledge** **Detailed knowledge about:** • Safety precautions while collecting information	reports •Binding machine •Photocopy machine •Overcoat •Safety boots	
		(b). Submitting technical reports	**Discussions:** Guide the student to discuss on how to submit technical reports **Demonstrations**	**The student should be able to:** •Select tools and equipment. •Collect information. •Write technical reports.	Technical reports submitted as per workshop guidelines	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain: Preparation of Submitting technical	**This element can be achieved at a work place or in a training institution.** **The following tools, equipment and safety gears are to be available: -**	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			Demonstrate to the students on Submitting technical reports **Hands-on Hands-on activity** Organise the students to Submit technical reports	•Prepare budget report. •Prepare action plan. •Keep records		reports **Principles:** The student should explain the principles of: Submitting technical reports. **Theories:** The student should explain: Importance of Submitting technical reports **Circumstantial knowledge** **Detailed knowledge about:** Submitting technical reports	Office/table and chairs •Stationery •Computer •Job card •Subordinates reports •Binding machine •Photocopy machine •Overcoat •Safety boots	
	6.6. Managing workshop business	(a) Performing entrepreneurial tactics	**Discussions:** Guide the student to discuss on how to Perform entrepreneurial	**The student should be able to:** •Calculate total project cost •Prepare project	Entrepreneurial tactics performed as per market requirements	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should	**This element can be achieved at a work place or in a training institution.** **The following tools, equipment and safety**	35

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			tactics **Demonstrations** Demonstrate to the students on Performing entrepreneurial tactics **Hands on activity** Organise the students to Perform entrepreneurial tactics	write up •Select appropriate site for establishing workshop •Acquire land/building for setting the workshop •Purchase basic hand tools and equipment. •Perform manpower planning •Prepare at least six months' salary for potential workers. •Supervise provision of payment invoices and receipts. •Identify labour		explain how to: Performing entrepreneurial tactics. **Principles:** The student should explain principles used to: Performing entrepreneurial tactics. **Theories:** The student should explain: • Meaning of Performing entrepreneurial tactics • Project write up procedures **Circumstantial knowledge** **Detailed knowledge about:** • Marketing and use of mass media.	**gears are to be available: -** Workshop layout chart •Business films/video cassettes •Business magazines •Workshop business regulations •Scheduled maintenance of machines •Job card sheets •Stationeries	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
				and overhead costs. •Analyze profit and loss		• Safe handling of business capital.		
		(b) Conducting manpower planning	**Discussions:** Guide the student to discuss on how to Conduct manpower planning **Demonstrations** Demonstrate to the students on Conducting manpower planning **Hands on activity** Organise the students to Conduct manpower	**The student should be able to:** •Calculate total project cost •Prepare project write up •Select appropriate site for establishing workshop •Acquire land/building for setting the workshop •Purchase basic hand tools and equipment •Perform manpower planning	Manpower planning conducted as per workshop requirements	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to: Conduct manpower planning. **Principles:** The student should explain principles used to: Conducting manpower planning. **Theories:** The student should explain: Meaning of manpower planning **Circumstantial knowledge**	**This element can be achieved at a work place or in a training institution.** **The following tools, equipment and safety gears should be available: -** Workshop layout chart •Business films/video cassettes •Business magazines. •Workshop business regulations •Scheduled maintenance of machines •Receipt book. •Invoice books •Workshop tools and equipment •Personal computer.	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			planning	•Prepare at least six months' salary for potential workers •Supervise provision of payment invoices and receipts. •Identify labour and overhead costs**.** •Analyzer profit and loss.		**Detailed knowledge about:** Conducting manpower planning	•Workshop store •Workshop office •Tool ledger book •Safety gears • Job card sheets •Stationeries	
		(c) Supervising junior workers	**Discussions:** Guide the student to discuss on how to Supervise junior workers **Demonstrations** Demonstrate to	**The student should be able to:** •Calculate total project cost •Prepare project write up •Select appropriate site for establishing workshop	Junior workers supervised as per workshop guidelines	**Knowledge evidence:** **Detailed knowledge of:** **Method used:** The student should explain how to: Supervise junior workers **Principles:** The student should	**This element can be achieved at a work place or in a training institution.** **The following tools, equipment and safety gears are to be available: -** Workshop layout chart •Business films/video	

Module Title (Main Competence)	Unit Title (Specific Competences)	Elements (Learning Activities)	Suggested Teaching and Learning Methods	Assessment Criteria			Training Requirements/ Suggested Resources	Number of Periods per Unit
				Process Assessment	Product/Services Assessment	Knowledge Assessment		
			the students on Supervising junior workers **Hands on activity** Organise the students to Supervise junior workers	•Acquire land/building for setting the workshop •Purchase basic hand tools and equipment •Perform manpower planning •Prepare at least six months' salary for potential workers •Supervise provision of payment invoices and receipts. •Identify labour and overhead costs •Analyzer profit and loss		explain principles used of: Supervising junior workers **Theories:** The student should explain: • Meaning of junior workers • Meaning of workshop **Circumstantial knowledge** **Detailed knowledge about:** Importance of supervising junior workers	cassettes •Business magazines •Workshop business regulations •Scheduled maintenance of machines Receipt book •Invoice books •Workshop tools and equipment •Personal computer. •Workshop store •Workshop office •Tool ledger book •Safety gears • Job card sheets • Stationaries	

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