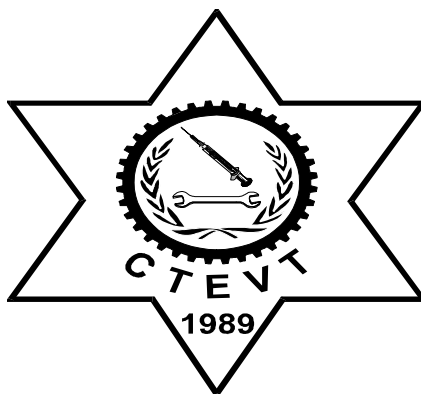


Motorcycle Mechanic [MM]

(Short Term Competency Based Curriculum)

2010



Council for Technical Education and Vocational Training (CTEVT)
CURRICULUM DEVELOPMENT DIVISION
SANOTHIMI, BHAKTAPUR

Table of contents

| | |
|---|----|
| Introduction | 3 |
| Aims | 3 |
| Objectives | 3 |
| Description | 3 |
| Course structure..... | 4 |
| Duration..... | 5 |
| Target group | 5 |
| Group size..... | 5 |
| Target location..... | 5 |
| Medium of instruction | 5 |
| Pattern of attendance | 5 |
| Focus of the program..... | 5 |
| Entry criteria..... | 5 |
| Follow up suggestion..... | 5 |
| Certificate requirement..... | 5 |
| Grading System | 5 |
| Student evaluation details..... | 6 |
| Trainers' qualification | 6 |
| Trainer – trainees ratio..... | 6 |
| Suggestion for instruction..... | 6 |
| List of modules and sub modules | 7 |
| Details of curriculum..... | 8 |
| Module: 1 : Motorcycle service and beginner mechanic..... | 8 |
| Module: 2: Motorcycle Electrical Mechanic | 19 |
| Module: 3: Motorcycle Engine and Transmission Mechanic..... | 24 |
| Module: 4: Motorcycle Driving..... | 30 |
| Module : 5 : Common module..... | 32 |
| Sub module: 1:Applied math..... | 32 |
| Sub module: 2: Occupational health and safety | 34 |
| Sub module: 3: First aid | 36 |
| Sub module: 4: HIV/AIDS | 38 |
| Sub module: 5 : Communication..... | 40 |
| Sub module: 6 : Small enterprise development..... | 44 |
| Tools and machines | 47 |
| Hand Tools | 47 |
| Measuring tools | 47 |
| Machines..... | 47 |
| Reading materials | 48 |
| Facilities | 48 |
| Appendices | 49 |

Introduction

This curriculum has been developed with a purpose of preparing "**Motorcycle Mechanic**" as a **lower level** technical workforce able to get employment in the country. The technical skills incorporated in this curriculum come from the **field of motorcycle mechanics**. Its contents are organized in the form of **modules**. So it is a tailor made curriculum with a special purpose to be implemented in a modular form.

It is a competency based curriculum. It is also designed to produce lower level technical workforce in the field of **motorcycle mechanics** equipped with skills and knowledge related to **motorcycle mechanics** in order to meet the demand of such workforce in the country so as to contribute in the national streamline of poverty reduction in Nepal.

Aims

The main aim of this curricular program is to produce skilled workforce in the field of **motorcycle mechanics** by providing training to the potential citizen of the country and link them to employment opportunities in the country and abroad. The aims of this curriculum are:

- To produce lower level technical workforce in the area of **motorcycle mechanics**
- To produce such technical workforce who will be able to serve the community and household people through the application of the techniques of **motorcycle mechanics** being an entrepreneur.

Objectives

After the completion of this training program, the trainees will be able:

- To perform servicing of motorbike
- To repair/maintain electrical system of motorbike
- To repair/maintain engine and transmission systems of motorbike
- To drive motorbike professionally

Description

This curriculum provides skills and knowledge necessary for "**Motorcycle Mechanic**" as a technical worker. There will be both demonstration by trainers/instructors and opportunity by trainees to carry out the skills/tasks necessary for this level of technical workforce. Trainees will practice and learn skills by using typical tools, materials and equipment necessary for this curricular program.

On successful completion of this training, the trainees will be able to perform mechanical servicing, repair/maintain electrical system, repair/maintain engine and transmission systems of motorbike, and drive motorbike professionally.

Course structure

| Job: Motorcycle Mechanic(MM) | | Nature | Time (hrs.) | | | Marks | | |
|-------------------------------------|--|--------------|-------------|-----------|------------|-----------|-----------|-----------|
| | | | Th. | Pr. | Tot. | Th. | Pr. | Tot. |
| | Modules/sub modules | | | | | | | |
| 1. | Motorcycle service and beginner mechanic | T + P | 20 | 80 | 100 | 15 | 60 | 75 |
| | 1. Servicing | T + P | 8 | 32 | 40 | | | |
| | 2. Chassis | T + P | 4 | 16 | 20 | | | |
| | 3. Suspension system | T + P | 2 | 8 | 10 | | | |
| | 4. Brake and control | T + P | 2 | 8 | 10 | | | |
| | 5. Fuel supply system | T + P | 4 | 16 | 20 | | | |
| 2. | Motorcycle Electrical Mechanic | T + P | 18 | 72 | 90 | 15 | 60 | 75 |
| | 1. General wiring | T + P | 3 | 12 | 15 | | | |
| | 2. Motorbike lighting and signaling system | T + P | 5 | 20 | 25 | | | |
| | 3. Charging and starting system | T + P | 6 | 24 | 30 | | | |
| | 4. Ignition system | T + P | 4 | 16 | 20 | | | |
| 3. | Motorcycle Engine and Transmission Mechanic | T + P | 20 | 80 | 100 | 15 | 60 | 75 |
| | 1. Engine | T + P | 13 | 52 | 65 | | | |
| | 2. Clutch and gear system | T + P | 5 | 20 | 25 | | | |
| | 3. Lubrication system | T + P | 2 | 8 | 10 | | | |
| 4. | Motorcycle Driving | T + P | 6 | 24 | 30 | 5 | 20 | 25 |
| | Sub-total: | | 64 | 256 | 320 | 50 | 200 | 250 |
| 5. | Common module | T + P | 14 | 56 | 70 | 10 | 40 | 50 |
| | 1. Applied math | T + P | 4 | 16 | 20 | | | |
| | 2. Occupational health and safety | T + P | 2 | 8 | 10 | | | |
| | 3. First aid | T + P | 1 | 4 | 5 | | | |
| | 4. HIV/AIDS | T + P | 1 | 4 | 5 | | | |
| | 5. Communication | T + P | 2 | 8 | 10 | | | |
| | 6. Small enterprise development | T + P | 4 | 16 | 20 | | | |
| | Grand total: | | 78 | 312 | 390 | 60 | 240 | 300 |

| |
|--|
| Duration |
| The total duration of this curricular program will be 390 hours [three months] |
| Target group |
| The target group for this training will be all the interested individuals of the country with academic qualification of grade ten pass. |
| Group size |
| The group size of this training program will be not more than 30 |
| Target location |
| The target location of this training program will be all over Nepal. |
| Medium of instruction |
| The medium of instruction for this training program will be Nepali or English or both. |
| Pattern of attendance |
| The trainees should have 80% attendance in theory classes and 90% in Practical (Performance) to be eligible for internal assessment and final examinations. |
| Focus of the program |
| This is a competency based curriculum. This curriculum emphasizes on competent performance of the task specified in it. Not less than 80% time is allotted to the competencies and not more than 20% to the related technical knowledge. So, the main focus will be on the performance of the specified competencies/tasks /skills included in this curriculum. |
| Entry criteria |
| Individuals who meet the following criteria will be allowed to enter in this curricular program: <ul style="list-style-type: none"> • Eight grade pass • Physically and mentally fit • Age : 16-25 years • Preference will be given to female, Dalit, Janjati, and Conflict affected people |
| Follow up suggestion |
| This is not a training program only for training sake. The ultimate success of this program will rest on the proficiency of the graduates of this training program in providing services in the community either by wage employment or by self-employment. In other to assess the success of this program and collect feedbacks/inputs for the revision of the program, a schedule of follow up is suggested as follows:- <ul style="list-style-type: none"> • First follow up: - Six months after the completion of the training program. • Second follow up: - Six months after the completion of the first follow up. • Follow up cycle: - In a cycle of one year after the completion of second follow up for five years |
| Certificate requirement |
| The related training institute will provide the certificate of “Motorcycle Mechanic” to those individuals who successfully complete all the tasks with their related technical knowledge specified in this curriculum. |
| Grading System |
| The trainees will be graded as follows based on the marks in percentage secured by them in |

tests/ evaluations.

- Distinction: Passed with 80% or above
- First Division: passed with 75% or above
- Second Division: passed with 65% or above
- Third Division: passed with 60% or above

Student evaluation details

- Continuous evaluation of the trainees' performance is to be done by the related instructor/trainer to ensure the proficiency over each competency.
- Related technical knowledge learnt by the trainees will be evaluated through written or oral tests as per the nature of the content
- Trainees must secure minimum marks of 60% in an average of both theory and practical evaluations.

Trainers' qualification

- Diploma in the related field
- Good communicative & instructional skills.
- Experience in the related field.

Trainer – trainees ratio

- 1:10 for practical classes
- Depends on the nature of subject matter and class room situation for theory classes.

Suggestion for instruction

1.Demonstrate task performance

- Demonstrate task performance in normal speed
- Demonstrate slowly with verbal description of each and every steps in the sequence of activity flow of the task performance using question and answer techniques
- Repeat the above step for the clarification on trainees demand if necessary.
- Perform fast demonstration of the task performance.

2. Provide trainees the opportunity to practice the task performance demonstrated.

- Provide trainees to have guided practice:- create environment for practicing the demonstrated task performance and guide the trainees in each and every step of task performance
- Provide trainees the opportunity to repeat & re-repeat as per the need to be proficient on the given task performance
- Switch to another task demonstration if and only if the trainees developed proficiency in the given task performance

3.Evaluation performance of the trainees/ student

- Perform task analysis
- Develop a detail task performance check list
- Perform continuous performance evaluation of the trainees / students by applying the performance check list.

List of modules and sub modules

Module: 1: Motorcycle service and beginner mechanic

Sub module: 1: Servicing

Sub module: 2: Chassis

Sub module: 3: Suspension system

Sub module: 4: Brake and control

Sub module: 5: Fuel supply system

Module: 2: Motorcycle Electrical Mechanic

Sub module: 1: General wiring

Sub module: 2: Motorbike lighting and signaling system

Sub module: 3: Charging and starting system

Sub module: 4: Ignition system

Module: 3: Motorcycle Engine and Transmission Mechanic

Sub module: 1: Engine

Sub module: 2: Clutch and gear system

Sub module: 3: Lubrication system

Module: 3: Motorcycle Driving

Sub module: 1: Applied math

Sub module: 2: Occupational health and safety

Sub module: 3: First aid

Sub module: 4: HIV/AIDS

Sub module: 5: Communication

Sub module: 6: Small enterprise development

Details of curriculum

| Module: 1 : Motorcycle service and beginner mechanic | | | | | |
|---|--|---|-------------|-----|------|
| Description: It includes the knowledge and skills necessary to perform servicing, repair/maintain chassis, repair/maintain suspension system, repair/maintain brake and control system, and repair/maintain fuel supply system of motorbikes. | | | | | |
| Objectives: <ul style="list-style-type: none"> • To perform servicing • To repair/maintain chassis • To repair/maintain suspension system • To repair/maintain brake and control system • To repair/maintain fuel supply system | | | | | |
| Sub module: Each sub module consists of tasks and their related technical knowledge with time allocation for both the knowledge and performance aspects of the sub module. | | | | | |
| | | 20 hrs. (Th.) + 80 hrs. (Pr.) = 100 hrs. | Time (hrs.) | | |
| SN | Sub modules/tasks | Related technical knowledge | Th. | Pr. | Tot. |
| 1. | Servicing: <ul style="list-style-type: none"> • Follow safety rules • Identify/handle tools/equipment • Read/interpret service manual • Wash the motorbike • Check/adjust clutch | Servicing: <ul style="list-style-type: none"> • <u>Safety rules:</u> <ul style="list-style-type: none"> ▪ Concept of safety rules ▪ List of related safety rules ▪ How of following safety rules • <u>Identification and handling of related tools and equipment:</u> <ul style="list-style-type: none"> ▪ List of related tools and equipment ▪ Identification of the tools and equipment ▪ Handling of the tools and equipment ▪ Safety precautions to be followed while handling the tools and equipment • <u>Service manual and its interpretation</u> <ul style="list-style-type: none"> ▪ Concept of service manual ▪ Identification of service manual ▪ Interpretation of service manual ▪ Related precautions • <u>Washing the motorbike:</u> <ul style="list-style-type: none"> ▪ Solvents for grease, oils etc. ▪ Locating and interpreting related data ▪ Environmental problems due to wastes • <u>Checking/adjusting clutch:</u> <ul style="list-style-type: none"> ▪ Locating and interpreting data from information source to adjust | 8 | 32 | 40 |

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|--|---|---|--|--|--|
| | <ul style="list-style-type: none"> • Check/adjust throttle grip • Check /adjust brake • Adjust / clean drive chain • Check/adjust air pressure • Check silencer • Clean air filter • Clean petrol tank | <ul style="list-style-type: none"> clutch <ul style="list-style-type: none"> ▪ Construction and function of clutch ▪ Safety • <u>Checking/adjusting throttle grip:</u> <ul style="list-style-type: none"> ▪ Operation and function of throttle grip ▪ Throttle grip adjustment procedure ▪ Safety • <u>Checking/adjusting the brake:</u> <ul style="list-style-type: none"> ▪ Locating and interpreting from information source to adjust brake ▪ Construction and function of brake ▪ Safety • <u>Adjusting and cleaning drive chain:</u> <ul style="list-style-type: none"> ▪ Locating and interpreting from information source to adjust/clean drive chain ▪ Construction and function of drive chain and sprocket ▪ Safety • <u>Checking/adjusting air pressure:</u> <ul style="list-style-type: none"> ▪ Procedure of checking and inflating air pressure in the tire ▪ Effect of air pressure on performance and tire life ▪ Locating and interpreting required data ▪ Safety • <u>Checking silencer:</u> <ul style="list-style-type: none"> ▪ Construction of silencer pipe ▪ Functioning of exhaust system ▪ Environmental problems and precautions to take with exhaust system ▪ Locating and interpreting required data ▪ Safety • <u>Cleaning air filter:</u> <ul style="list-style-type: none"> ▪ Locating and interpreting data from information source to clean air filter ▪ Construction and function of air | | | |
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| | <ul style="list-style-type: none"> • Clean and adjust spark plug • Change/replace engine oil • Change fork oil • Check electrical problems • Recharge the battery • Check/replace wheel rim and bearing | <ul style="list-style-type: none"> filter <ul style="list-style-type: none"> ▪ Safety • <u>Cleaning petrol tank:</u> <ul style="list-style-type: none"> ▪ Construction of petrol tank and fuel system ▪ Environmental problems and precautions to take with spillage and disposal of contaminated fuel ▪ Locating and interpreting required data ▪ Safety • <u>Checking/adjusting spark plug:</u> <ul style="list-style-type: none"> ▪ Locating and interpreting data from information source to clean the spark plug and set electrode gap ▪ Spark plug testing and fitting ▪ Safety • <u>Changing/replacing engine oil:</u> <ul style="list-style-type: none"> ▪ Lubricating oil and its function ▪ Environmental problems and precautions to take with spillage and disposal of oil ▪ Locating and interpreting required data ▪ Safety • <u>Changing fork oil:</u> <ul style="list-style-type: none"> ▪ Fork oil and its replacement procedure ▪ Related environmental problems and precautions ▪ Locating and interpreting required data ▪ Safety • <u>Checking electrical problems:</u> <ul style="list-style-type: none"> ▪ Locating and interpreting data from information source to inspect, test and rectify faults in the electrical system ▪ Safety • <u>Recharging the battery:</u> <ul style="list-style-type: none"> ▪ Locating and interpreting data from information source to inspect, test and recharge the battery ▪ Environmental problems caused | | | |
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| | <ul style="list-style-type: none"> • Check/adjust valve clearance • Check/clean oil pump tank(2-stroke) • Clean carburetor • Check all faults | <p>by spillage of electrolyte</p> <ul style="list-style-type: none"> ▪ Safety <ul style="list-style-type: none"> • <u>Checking/replacing wheel rim and bearing:</u> <ul style="list-style-type: none"> ▪ Procedure of checking and replacing wheel rim and wheel bearing, its disassembly and assembly ▪ Locating and interpreting required data ▪ Safety • <u>Checking/adjusting valve clearance:</u> <ul style="list-style-type: none"> ▪ Construction of four stroke engine ▪ Procedure of adjusting tappet clearance ▪ Environmental problems and precautions to take with excessive exhaust emission ▪ Locating and interpreting required data ▪ Safety • <u>Checking /cleaning oil pump tank(2-stroke):</u> <ul style="list-style-type: none"> ▪ Construction and working of oil pump ▪ Environmental problems and precautions to take with spillage and disposal of oil ▪ Locating and interpreting required data ▪ Safety • <u>Cleaning carburetor:</u> <ul style="list-style-type: none"> ▪ Construction and function of carburetor ▪ Environmental problems caused by improper combustion of fuel due to improper functioning of carburetor(extant emission) ▪ Solvent selection ▪ Cleaning procedure ▪ Adjustment of float and idling screw ▪ Air fuel ratio and use of gas analyzer ▪ Safety | | | |
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|----|---|--|---|----|----|
| | <ul style="list-style-type: none"> Keep records | <ul style="list-style-type: none"> <u>Checking all faults:</u> <ul style="list-style-type: none"> Operation of motorbike Traffic rules and regulations Fault finding and troubleshooting procedures Environmental problems due to motorbike exhaust Locating and interpreting data as required by a motorbike mechanic Safety <u>Related records to be kept:</u> <ul style="list-style-type: none"> Concept of records System of keeping related records Format of related records Precautions to be taken while keeping related records | | | |
| 2. | <p>Chassis:</p> <ul style="list-style-type: none"> Check/change suspension bush rod Check/repair single/double stand Change foot rest rubber Check/repair/replace handle bar | <p>Chassis:</p> <ul style="list-style-type: none"> <u>Checking/changing suspension bush rod:</u> <ul style="list-style-type: none"> Locating and interpreting data and information about suspension and its maintenance Dismantling procedure and rifting them Safety precautions <u>Checking /repairing single/double stand:</u> <ul style="list-style-type: none"> Dismantling procedure and rifting the components of stands, stability of motorbike Safety precautions <u>Change foot rest rubber:</u> <ul style="list-style-type: none"> Removing procedure and rifting the components of foot rest stands, stability of motorbike Environmental problems due to disposal of rubber items Safety precautions <u>Checking / repairing /replacing handle bar:</u> <ul style="list-style-type: none"> Locating and interpreting data and information about handlebar and its maintenance Interpreting data and information obtained from observations | 4 | 16 | 20 |

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|--|---|--|--|--|--|
| | <ul style="list-style-type: none"> • Inspect/replace steering race ball/ bearing(cone bearing) • Change clutch/brake yoke • Inspect chassis condition • Check/replace tire | <ul style="list-style-type: none"> ▪ Dismantling procedure of accessories fitted in the handlebar and rifting them ▪ Safety precautions • <u>Inspect /replacing steering race ball/ bearing:</u> <ul style="list-style-type: none"> ▪ Locating and interpreting data and information about steering race ball/bearings and its maintenance ▪ Interpreting data and information obtained from observations ▪ Dismantling procedure of accessories fitted in it and rifting them ▪ Safety precautions • <u>Changing clutch/brake yoke:</u> <ul style="list-style-type: none"> ▪ Locating and interpreting data and information about clutch/brake yoke ▪ Dismantling procedure of clutch/brake yoke and rifting them ▪ Safety precautions • <u>Inspecting chassis condition:</u> <ul style="list-style-type: none"> ▪ Construction of chassis ▪ Checking procedure of the condition of chassis for any cracks, distortions or corrosion ▪ Safety precautions • <u>Checking of tire:</u> <ul style="list-style-type: none"> ▪ Locating and interpreting data and information about tire and its maintenance ▪ Interpreting data and information obtained from manual ▪ Construction of tire ▪ Measuring and adjusting tire pressure ▪ Road testing for tire problems ▪ Measuring and correcting radial and lateral layout, balancing and tread height ▪ Removing tire from wheel rim and refitting new tire | | | |
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|----|---|---|---|---|----|
| | <ul style="list-style-type: none"> • Repair/replace tube • Check /change drive chain/ sprocket • Inspect/repair wheel rim/spoke wire | <ul style="list-style-type: none"> ▪ Environmental problems caused by disposal of old tire ▪ Safety precautions • <u>Repairing/replacing tube:</u> <ul style="list-style-type: none"> ▪ Locating and interpreting data and information about tube and its maintenance ▪ Removing tube from tire and refitting tube ▪ Environmental problems caused by disposal of old tube ▪ Safety precautions • <u>Checking and changing drive chain/sprocket:</u> <ul style="list-style-type: none"> ▪ Locating and interpreting data from information source to check condition of sprocket and adjusting/cleaning the drive chain ▪ Function and construction of drive chain and sprocket ▪ Safety precautions • <u>Inspect/repair wheel rim/spoke wire:</u> <ul style="list-style-type: none"> ▪ Locating and interpreting data from information source to check condition of wheel rim/spoke wire and adjusting/cleaning the them ▪ Function of wheel rim/spoke wire ▪ Safety precautions | | | |
| 3. | <p>Suspension system:</p> <ul style="list-style-type: none"> • Inspect/change fork oil seal/oil/dust boot • Check/adjust rear shock absorber | <p><u>Suspension system:</u></p> <ul style="list-style-type: none"> • <u>Inspecting/changing fork oil seal:</u> <ul style="list-style-type: none"> ▪ Replacement, assembly and disassembly procedure of front fork oil seal ▪ Environmental problems and precautions to take with spillage and disposal of contaminated fuel ▪ Locating and interpreting data as required by the mechanic ▪ Safety precautions • <u>Checking/adjust rear shock absorber:</u> <ul style="list-style-type: none"> ▪ Locating and interpreting data and information about | 2 | 8 | 10 |

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|----|--|---|---|---|----|
| | <ul style="list-style-type: none"> • Check/change fork spring • Inspect/repair/replace swing arm/bushes | <p>suspension and its maintenance as required by the mechanic</p> <ul style="list-style-type: none"> ▪ Checking, dismantling and refitting procedure ▪ Safety precautions <ul style="list-style-type: none"> • <u>Checking/changing fork spring:</u> <ul style="list-style-type: none"> ▪ Replacement, assembly and disassembly procedure of front fork ▪ Inspection procedure of fork spring ▪ Environmental problems and precautions to take with spillage and disposal of oil ▪ Safety precautions ▪ Locating and interpreting data as required by the mechanic ▪ Safety precautions • <u>Inspecting/repairing/replacing of swing arm/bushes:</u> <ul style="list-style-type: none"> ▪ Concept and need ▪ Identification of swing arm/bushes ▪ Functions of swing arm/bushes ▪ Procedures for inspecting/repairing/replacing of swing arm/bushes ▪ Safety precautions | | | |
| 4. | <p>Brake and control:</p> <ul style="list-style-type: none"> • Check/change brake cable • Check/change clutch cable | <p>Brake and control system:</p> <ul style="list-style-type: none"> • <u>Checking/changing brake cable:</u> <ul style="list-style-type: none"> ▪ Locating and interpreting related data from information source ▪ Condition checking procedures of break cable ▪ Changing procedure of break cable ▪ Function and construction of break cable ▪ Safety precautions • <u>Checking/changing clutch cable:</u> <ul style="list-style-type: none"> ▪ Locating and interpreting related data from information source to check condition of clutch cable and hose ▪ Function and construction of clutch Safety precautions | 2 | 8 | 10 |

| | | | | | |
|--|--|--|--|--|--|
| | <ul style="list-style-type: none"> • Check/change speedometer cable • Check/change speedometer gear • Check/change front brake drum and brake shoe • Check/change rear brake drum and brake shoe | <ul style="list-style-type: none"> • <u>Checking/changing speedometer cable:</u> <ul style="list-style-type: none"> ▪ Locating and interpreting related data from information source to check condition of speedometer cable ▪ and hose ▪ Function and construction of speedometer ▪ Safety precautions • <u>Checking/changing speedometer gear:</u> <ul style="list-style-type: none"> ▪ Locating and interpreting related data from information source to check condition of speedometer gear ▪ Function and construction of speedometer ▪ Procedure of front wheel removal, disassembly and assembly of components of wheel, adjustment of front brake ▪ Safety precautions • <u>Checking/changing front brake drum and brake shoe:</u> <ul style="list-style-type: none"> ▪ Locating and interpreting related data from information source to check front brake shoe lining and brake drum ▪ Function and construction of front brake system ▪ Procedure of front wheel removal, disassembly and assembly of components of braking system and adjustment of front brake ▪ Safety precautions • <u>Checking/changing rear brake drum and brake shoe:</u> <ul style="list-style-type: none"> ▪ Locating and interpreting related data from information source to check the condition of rear brake shoe lining and brake drum ▪ Function and construction of rear brake system ▪ Procedure of rear wheel removal, | | | |
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|----|---|--|---|----|----|
| | <ul style="list-style-type: none"> • Check/change disc brake and brake pad/caliper • Repair/replace hydraulic brake(master cylinder/wheel cylinder kit) | <p>disassembly and assembly of components of braking system and adjustment of rear brake</p> <ul style="list-style-type: none"> ▪ Safety precautions • <u>Checking/changing disc brake and brake pad/caliper:</u> <ul style="list-style-type: none"> ▪ Locating and interpreting related data from information source to check the condition of disc brake and brake pad/caliper ▪ Function and construction of rear brake system ▪ Procedure of front wheel removal, disassembly and assembly of components of braking system like pads, caliper, disc and adjustment of brake ▪ Safety precautions • <u>Repair/replacing hydraulic brake:</u> <ul style="list-style-type: none"> ▪ Locating and interpreting related data from information source to check the condition of hydraulic brake ▪ Function and construction of hydraulic brake system ▪ Procedure of disassembly and assembly of components of hydraulic braking system like master cylinder, pads, caliper and disc ▪ Adjustment of hydraulic brakes ▪ Safety precautions | | | |
| 5. | <p>Fuel supply system:</p> <ul style="list-style-type: none"> • Clean tank and on/off switch/fuel cock • Inspect /change oil seals/O-rings | <p>Fuel supply system:</p> <ul style="list-style-type: none"> • <u>Cleaning tank and on/off switch/fuel cock:</u> <ul style="list-style-type: none"> ▪ Construction of petrol tank and fuel supply system ▪ Function and construction of fuel cock ▪ Environmental problems and precautions to take with spillage and disposal of contaminated fuel ▪ Safety precautions • <u>Inspecting/changing oil seals/O-rings:</u> <ul style="list-style-type: none"> ▪ Construction and function of | 4 | 16 | 20 |

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| | <ul style="list-style-type: none"> • Check petrol pipe • Clean/ check petrol filter • Service/repair carburetor • Inspect/replace carburetor kit • Replace throttle valve | <p>fuel cock</p> <ul style="list-style-type: none"> ▪ Cleaning, removing and refitting procedure of oil seals/O-rings ▪ Environmental problems caused by spillage of fuel ▪ Safety procedure <ul style="list-style-type: none"> • <u>Checking petrol pipe:</u> <ul style="list-style-type: none"> ▪ Construction of fuel lines ▪ Environmental problems caused by spillage of fuel ▪ Safety procedure • <u>Cleaning /checking petrol filter:</u> <ul style="list-style-type: none"> ▪ Construction of fuel filters ▪ Dismantling and cleaning procedure ▪ Environmental problems caused by spillage of fuel ▪ Safety procedure • <u>Servicing/repairing carburetor:</u> <ul style="list-style-type: none"> ▪ Construction and function of carburetor ▪ Environmental problems caused by improper combustion of fuel due to improper functioning of carburetor (exhaust emission) ▪ Selection of solvent and cleaning procedure ▪ Air fuel ratio and use of gas analyzer ▪ Safety procedure • <u>Inspecting/replacing carburetor kit:</u> <ul style="list-style-type: none"> ▪ Construction and function of carburetor kit ▪ Procedure of carburetor kit disassembly, assembly, inspection and adjustment ▪ Environmental problems caused by improper combustion of fuel due to improper functioning of carburetor kit (exhaust emission) ▪ Safety procedure • <u>Replacing throttle valve:</u> <ul style="list-style-type: none"> ▪ Construction and function of throttle ▪ Procedure of throttle valve disassembly, assembly, inspection, | | | |
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| | <ul style="list-style-type: none"> • Clean/adjust float • Service/replace electric fuel injection system • Tune up the carburetor | <ul style="list-style-type: none"> cleaning and adjustment <ul style="list-style-type: none"> ▪ Environmental problems caused by improper combustion of fuel due to improper functioning of carburetor (exhaust emission) ▪ Safety procedure • Cleaning/adjusting float: <ul style="list-style-type: none"> ▪ Construction and function of carburetor, float circuit ▪ Procedure of adjusting float ▪ Environmental problems caused by improper combustion of fuel due to improper functioning of carburetor (exhaust emission) ▪ Safety procedure • Servicing/replacing electric fuel injection system: <ul style="list-style-type: none"> ▪ Introduction ▪ Purpose and importance ▪ Components ▪ Method of sensing ▪ Testing and fault finding ▪ Safety precautions • Tuning up the carburetor: <ul style="list-style-type: none"> ▪ Air fuel ratio ▪ Idle speed ▪ High speed ▪ Choke function ▪ Safety | | | |
| | | Sub-total: | 20 | 80 | 100 |
| Module: 2: Motorcycle Electrical Mechanic | | | | | |
| Description: It includes the knowledge and skills necessary to perform general wiring, repair/maintain chassis, repair/maintain suspension system, repair/maintain brake and control system, and repair/maintain fuel supply system of motorbikes. | | | | | |
| Objectives: | | | | | |
| <ul style="list-style-type: none"> • To perform general wiring • To repair/maintain motorbike lighting and signaling system • To repair/maintain charging and starting system • To repair/maintain ignition system | | | | | |
| Sub module: Each sub module consists of tasks and their related technical knowledge with time allocation for both the knowledge and performance aspects of the sub module. | | | | | |
| 18 hrs. (Th.) + 72 hrs. (Pr.) = 90 hrs. | | | Time (hrs.) | | |
| SN | Sub modules/tasks | Related technical knowledge | Th. | Pr. | Tot. |
| 1. | General wiring: | General wiring: | 3 | 12 | 15 |
| | • Check/replace fuse | • <u>Checking/replacing fuse:</u> | | | |

| | | | | | |
|----|--|--|---|----|----|
| | <ul style="list-style-type: none"> • Check/repair wiring condition | <ul style="list-style-type: none"> ▪ Locating and interpreting data and information about electrical system, fuse and its function and maintenance as required by this mechanic ▪ Interpreting data and information obtained from observations ▪ Environmentally safe way of disposal of damaged fuse ▪ Safety precautions • <u>Checking/ repairing wiring condition:</u> <ul style="list-style-type: none"> ▪ Locating and interpreting data and information about wiring and wiring accessories and its maintenance as required by this mechanic ▪ Interpreting data and information obtained from observations ▪ Environmental hazards related with the disposal of non-repairable electrical wiring components ▪ Safety precautions | | | |
| 2. | <p>Motorcycle lighting and signaling system:</p> <ul style="list-style-type: none"> • Check/replace bulbs and indicating lamp • Align head light • Check/replace/repair horn | <p><u>Motorcycle lighting and signaling system:</u></p> <ul style="list-style-type: none"> • <u>Checking/replacing bulbs and indicating lamp:</u> <ul style="list-style-type: none"> ▪ Locating and interpreting data and information about bulbs and indicators used in motorbike ▪ Interpreting data and information obtained from observations ▪ Environmental problems with the damaged bulb disposal ▪ Safety precautions • <u>Aligning head light:</u> <ul style="list-style-type: none"> ▪ Locating and interpreting data and information about head light alignment of motorbike ▪ Safety precautions • <u>Checking/replacing/repairing horn:</u> <ul style="list-style-type: none"> ▪ Locating and interpreting data and information about horn, its construction and maintenance ▪ Interpreting data and information obtained from observations | 5 | 20 | 25 |

| | | | | | |
|----|---|---|---|----|----|
| | <ul style="list-style-type: none"> • Check/replace flasher relay • Adjust/replace brake light switch <p>Repair/replace digital display unit</p> | <ul style="list-style-type: none"> ▪ Environmental hazards related with the disposal of no repairable horn components ▪ Safety precautions • <u>Checking/replacing flasher relay:</u> <ul style="list-style-type: none"> ▪ Locating and interpreting data and information about flasher relay used in motorbike ▪ Safety precautions • <u>Adjusting/replacing brake light switch:</u> <ul style="list-style-type: none"> ▪ Locating and interpreting data and information about brake light switches used in motorbike ▪ Adjustment of brake light switch ▪ Safety precautions <p><u>Repairing/replacing digital display unit:</u> Concept of electronics/ digital display unit Function of digital display unit Components of digital display unit Fault finding in digital display unit Process of repairing and replacing digital display unit Safety</p> | | | |
| 3. | <p>Charging and starting system:</p> <ul style="list-style-type: none"> • Check/maintain battery condition • Recharge battery | <p>Charging and starting system:</p> <ul style="list-style-type: none"> • <u>Checking/maintaining battery condition:</u> <ul style="list-style-type: none"> ▪ Locating and interpreting data and information about battery, its testing and maintenance ▪ Interpreting data and information obtained from observations ▪ Environmental hazards related with the disposal of no repairable battery components and damaged batteries ▪ Safety precautions • <u>Recharging battery:</u> <ul style="list-style-type: none"> ▪ Locating and interpreting data and information source to inspect, test and recharge the battery ▪ Environmental problems caused by accidental spillage of | 6 | 24 | 30 |

| | | | | | |
|--|---|--|--|--|--|
| | <ul style="list-style-type: none"> • Check/replace rectifier/regulator / rectifier –regulator unit • Check/replace flywheel magneto alternator • Check/repair/replace charging and lighting coil • Check/repair/ replace self-starting system | <p>electrolyte</p> <ul style="list-style-type: none"> ▪ Safety precautions <ul style="list-style-type: none"> • <u>Checking/replacing rectifier /regulator / rectifier –regulator unit:</u> <ul style="list-style-type: none"> ▪ Locating and interpreting data and information about rectifier – regulator used in charging system of a motorbike, its construction and maintenance ▪ Interpreting data and information obtained from observations ▪ Environmental hazards related with the disposal of non-repairable rectifier/regulator / rectifier –regulator components ▪ Safety precautions • <u>Checking/replacing flywheel magneto alternator:</u> <ul style="list-style-type: none"> ▪ Locating and interpreting data and information about alternator used in charging system of a motorbike ▪ Testing alternator ▪ Interpreting data and information obtained from observations ▪ Environmental hazards related with the disposal of damaged alternator components ▪ Safety precautions • <u>Checking/repairing/replacing charging and lighting coil:</u> <ul style="list-style-type: none"> ▪ Locating and interpreting data and information about charging and lighting coil used in charging system of a motorbike ▪ Working principle and fault finding ▪ Interpreting data and information obtained from observations ▪ Environmental hazards related with the disposal of damaged and non-repairable components ▪ Safety precautions • <u>Checking/repairing/replacing self-starting system:</u> | | | |
|--|---|--|--|--|--|

| | | | | | |
|----|--|--|---|----|----|
| | | <ul style="list-style-type: none"> ▪ Locating and interpreting data and information about self-starting system of motorbike ▪ Testing starting motor ▪ Interpreting data and information obtained from observations ▪ Locating and identifying faults in self-starting system ▪ Environmental hazards related with the disposal of damaged starting system components ▪ Safety precautions | | | |
| 4. | <p>Ignition system:</p> <ul style="list-style-type: none"> • Check/replace ignition coil • Check/replace spark plug • Maintain breaker point ignition unit | <p><u>Ignition system:</u></p> <ul style="list-style-type: none"> • <u>Check/replace ignition coil:</u> <ul style="list-style-type: none"> ▪ Locating and interpreting data and information about ignition coil used in ignition system of motorbike ▪ Testing ignition coil ▪ Interpreting data and information obtained from observations ▪ Environmental hazards related with the disposal of damaged ignition coil ▪ Safety precautions • <u>Checking/replacing spark plug:</u> <ul style="list-style-type: none"> ▪ Locating and interpreting data and information about spark plug and its maintenance ▪ Interpreting data and information obtained from observations ▪ Environmental problems related with the disposal of damaged spark plug ▪ Safety precautions • <u>Maintaining breaker point ignition unit :</u> <ul style="list-style-type: none"> ▪ Locating and interpreting data and information about breaker point ignition unit ▪ Testing breaker point ignition unit ▪ Interpreting data and information obtained from observations ▪ Environmental hazards related with the disposal of damaged | 4 | 16 | 20 |

| | | | | | |
|---|--|---|----|-------------|----|
| | <ul style="list-style-type: none"> • Check/replace electronic ignition (CDI) unit • Check/adjust ignition timing • Check/replace source/pick up coil | <p>breaker point ignition unit components</p> <ul style="list-style-type: none"> ▪ Safety precautions <ul style="list-style-type: none"> • <u>Checking/replacing electronic ignition (CDI) unit:</u> <ul style="list-style-type: none"> ▪ Locating and interpreting data and information about electronic ignition (CDI) unit ▪ Interpreting data and information obtained from observations ▪ Environmental hazards related with the disposal of damaged electronic ignition (CDI) unit, pick up coil and other parts ▪ Safety precautions • <u>Checking/adjusting ignition timing:</u> <ul style="list-style-type: none"> ▪ Locating and interpreting data and information about ignition system and ignition timing ▪ Function of breaker point/CDI unit ▪ Procedure of checking ignition timing ▪ Procedure of repairing/adjusting breaker point ▪ Environmental problems with disposal of non-repairable components ▪ Safety precautions <p><u>Check/replace source/pick up coil:</u></p> <ul style="list-style-type: none"> ▪ Introduction to source/pick up coil ▪ Working principle ▪ Fault finding ▪ Safety precautions | | | |
| | | Sub-total: | 18 | 72 | 90 |
| Module: 3: Motorcycle Engine and Transmission Mechanic | | | | | |
| | Description: It includes the knowledge and skills necessary to repair and maintain engine, clutch and gear system, and lubrication system. | | | | |
| | Objectives: <ul style="list-style-type: none"> • To repair / maintain engine • To repair / maintain clutch and gear system • To repair / maintain lubrication system | | | | |
| | Sub module: Each sub module consists of tasks and their related technical knowledge with time allocation for both the knowledge and performance aspects of the sub module. | | | | |
| | 20 hrs. (Th.) + 80 hrs. (Pr.) =100 hrs. | | | Time (hrs.) | |

| SN | Sub modules/tasks | Related technical knowledge | Th. | Pr. | Tot. |
|----|---|---|-----|-----|------|
| 1. | <p>Engine:</p> <ul style="list-style-type: none"> • Remove and reinstall the engine • Decarbonize cylinder head • Inspect cylinder • Remove/replace piston • Inspect/replace piston ring set • Change connecting rod set | <p>Engine:</p> <ul style="list-style-type: none"> • <u>Removing and reinstalling the engine:</u> <ul style="list-style-type: none"> ▪ Locating and interpreting data from manuals ▪ Procedure of removing the cylinder head from engine, removing carbon deposits, lapping the wrapped surface and installing head into engine ▪ Safety precautions • Decarbonizing cylinder head: <ul style="list-style-type: none"> ▪ Locating and interpreting data from manuals ▪ Procedure of removing the cylinder head from engine, removing carbon deposits, lapping the wrapped surface and installing head into engine ▪ Safety precautions • <u>Inspecting cylinder and inspect:</u> <ul style="list-style-type: none"> ▪ Locating and interpreting data from manuals ▪ Inspection of cylinder ▪ Procedure of removing /reinstalling engine ▪ Reason of re-boring the engine and boring limits ▪ Safety precautions • <u>Removing/replacing piston:</u> <ul style="list-style-type: none"> ▪ Locating and interpreting data from manuals ▪ Procedure of removing /refitting piston ring set ▪ Safety precautions • <u>Inspecting/replacing piston ring set:</u> <ul style="list-style-type: none"> ▪ Locating and interpreting data from manuals ▪ Procedure of measuring side and end clearance and adjusting end clearance ▪ Procedure of removing /refitting piston ring set ▪ Safety precautions • <u>Changing connecting rod set:</u> <ul style="list-style-type: none"> ▪ Locating and interpreting data | 13 | 52 | 65 |

| | | | | | |
|--|--|---|--|--|--|
| | <ul style="list-style-type: none"> • Change piston pin • Inspect crankshaft/change bearings • Change gasket set • Remove/repair/install cylinder head • Inspect rocker arm | <ul style="list-style-type: none"> from manuals <ul style="list-style-type: none"> ▪ Procedure of measuring clearance, free play and alignment ▪ Procedure of removing /refitting connecting rod and bearings ▪ Safety precautions • <u>Changing piston pin:</u> <ul style="list-style-type: none"> ▪ Locating and interpreting data from manuals ▪ Procedure of measuring clearance ▪ Procedure of removing /refitting piston pin ▪ Safety precautions • <u>Inspecting crankshaft/changing crank bearings:</u> <ul style="list-style-type: none"> ▪ Locating and interpreting data from manuals ▪ Procedure of measuring clearance, free play and alignment ▪ Procedure of removing /refitting crankshaft and bearings ▪ Repairing crankshaft ▪ Safety precautions • <u>Changing gasket set:</u> <ul style="list-style-type: none"> ▪ Locating and interpreting data from manuals ▪ Function of gasket ▪ Procedure of gasket replacement ▪ Safety precautions • <u>Removing/repairing/installing cylinder head:</u> <ul style="list-style-type: none"> ▪ Locating and interpreting data from manual ▪ Procedure for removing the cylinder head from engine ▪ Disassembling components, removing carbon deposits, lapping the wrapped surface and installing head into engine ▪ Safety precautions • <u>Inspecting rocker arm:</u> <ul style="list-style-type: none"> ▪ Locating and interpreting data from manual ▪ Procedure of removing the cylinder head from engine, | | | |
|--|--|---|--|--|--|

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|--|---|---|--|--|--|
| | <ul style="list-style-type: none"> • Inspect rocker arm pin • Inspect push rod • Inspect/replace valves • Repair valve guide | <p>disassembling and assembling components and installing head into engine</p> <ul style="list-style-type: none"> ▪ Method of inspecting rocker arm and measuring hole diameter ▪ Safety precautions <ul style="list-style-type: none"> • <u>Inspecting rocker arm pin:</u> <ul style="list-style-type: none"> ▪ Locating and interpreting data from manual ▪ Procedure of removing the cylinder head from engine, disassembling and assembling components and installing head into engine ▪ Method of inspecting rocker arm pin and measuring outside diameter ▪ Safety precautions • <u>Inspecting push rod:</u> <ul style="list-style-type: none"> ▪ Locating and interpreting data from manual ▪ Procedure of removing the cylinder head from engine, disassembling and assembling components and installing head into engine ▪ Method of inspecting punch rod and measuring its length ▪ Safety precautions • <u>Inspecting and replacing valves:</u> <ul style="list-style-type: none"> ▪ Locating and interpreting data from information source ▪ Procedure of removing the cylinder head from engine, disassembling components, removing carbon deposits, lapping the valve and installing head into engine ▪ Safety precautions • <u>Repairing valve guide:</u> <ul style="list-style-type: none"> ▪ Locating and interpreting data from manual ▪ Procedure of removing the cylinder head from engine ▪ Disassembling components , removing carbon deposits, | | | |
|--|---|---|--|--|--|

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|--|--|---|--|--|--|
| | <ul style="list-style-type: none"> • Perform valve seat inspection /lapping • Change valve spring and valve oil seal • Inspect/change cam shaft • Set valve timing • Adjust tappet clearance • Measure engine components (piston/rings/cylinder/ piston pins/crank) | <ul style="list-style-type: none"> lapping the valve and valve seat <ul style="list-style-type: none"> ▪ Safety precautions • <u>Valve seat inspection and re-finishing:</u> <ul style="list-style-type: none"> ▪ Locating and interpreting data from manual ▪ Concept of lathe operation including re-facing ▪ Procedure of removing the cylinder head from engine, disassembling and assembling cylinder head components, lapping the valve and valve seat ▪ Safety precautions • <u>Changing valve spring and valve oil seal:</u> <ul style="list-style-type: none"> ▪ Locating and interpreting data from manual ▪ Procedure of removing the cylinder head from engine ▪ Disassembling and assembling cylinder head components ▪ Safety precautions • <u>Inspecting/changing cam shaft:</u> <ul style="list-style-type: none"> ▪ Locating and interpreting data from manual ▪ Procedure of removing the cylinder head, cylinder from crankcase, separating, disassembling and assembling crankcase components ▪ Safety precautions • <u>Setting valve timing:</u> <ul style="list-style-type: none"> ▪ Concept and need of valve timing ▪ Procedure of setting valve timing ▪ Precautions • <u>Adjusting tappet clearance:</u> <ul style="list-style-type: none"> ▪ Concept and need for adjusting tappet clearance ▪ Procedure of adjusting tappet clearance ▪ Safety precautions • <u>Measuring engine components (piston/rings/cylinder/ piston pins/crank):</u> <ul style="list-style-type: none"> ▪ Concept of measurement ▪ Identification of engine | | | |
|--|--|---|--|--|--|

| | | | | | |
|----|---|---|---|----|----|
| | | <p>components(such as piston, rings, cylinder, piston pins & crank)</p> <ul style="list-style-type: none"> ▪ Tools/instruments to be used ▪ Methods for measuring engine components ▪ Specification/limits ▪ Safety precautions | | | |
| 2. | <p>Clutch and gear system:</p> <ul style="list-style-type: none"> • Change clutch plate/friction plate • Change clutch assembly • Remove/check/replace gear assembly • Check/replace gear shaft fork • Check/replace shift cam(gear drum) | <p>Clutch and gear system:</p> <ul style="list-style-type: none"> • <u>Changing clutch plate/friction plate:</u> <ul style="list-style-type: none"> ▪ Locating and interpreting data from manuals ▪ Procedure for removing clutch /friction plate their inspection and assembling ▪ Safety precautions • <u>Changing clutch assembly:</u> <ul style="list-style-type: none"> ▪ Locating and interpreting data from manuals ▪ Procedure for removing clutch assembly, their inspection and assembling into the bike ▪ Safety precautions • <u>Removing/checking/replacing gear assembly:</u> <ul style="list-style-type: none"> ▪ Locating and interpreting data from manuals ▪ Procedure for removing cylinder, crankcase and gear assembly ▪ Inspecting gear assembly and refitting them ▪ Safety precautions • <u>Checking/replacing gear shaft fork:</u> <ul style="list-style-type: none"> ▪ Locating and interpreting data from manuals ▪ Procedure for removing cylinder, crankcase and gear assembly ▪ Inspecting gear shaft fork and refitting them ▪ Safety precautions • <u>Checking/replacing shift cam(gear drum):</u> <ul style="list-style-type: none"> ▪ Locating and interpreting data from manuals ▪ Procedure for removing cylinder, crankcase and gear assembly ▪ Inspecting shift cam and refitting | 5 | 20 | 25 |

| | | | | | |
|--|--|---|----|----|-----|
| | <ul style="list-style-type: none"> Change kick starter Check/replace gear shifting shaft and lever | <ul style="list-style-type: none"> them <ul style="list-style-type: none"> Safety precautions <u>Changing kick starter:</u> <ul style="list-style-type: none"> Locating and interpreting data from manuals Procedure for removing kick starter, their inspection and reassembling into the bike Safety precautions <u>Checking/replacing gear shifting shaft and lever:</u> <ul style="list-style-type: none"> Locating and interpreting data from manuals Procedure for removing and inspecting shifting shaft /spring and replacing them Safety precautions | | | |
| 3. | <p>Lubrication system:</p> <ul style="list-style-type: none"> Check/change oil filter and pump Check/change oil pump gear/sprocket | <p>Lubrication system:</p> <ul style="list-style-type: none"> <u>Checking/changing oil filter and pump:</u> <ul style="list-style-type: none"> Function of oil filter/pump and its construction Lubricating oil and its function Environmental problems and precautions to take with spillage and disposal of oil Locating and interpreting data Safety precautions <u>Checking/changing oil pump gear/sprocket:</u> <ul style="list-style-type: none"> Locating and interpreting data from manuals Procedure for removing oil pump and replacing gear/sprocket Environmental problems and precautions to take with spillage and disposal of oil Safety precautions | 2 | 8 | 10 |
| | | Subtotal: | 20 | 80 | 100 |
| Module: 4: Motorcycle Driving | | | | | |
| Description: It includes the knowledge and skills necessary to practice balancing and steering control of motorcycle, drive motorcycle on plain road, drive motorcycle uphill and downhill, drive motorcycle in severe condition, and drive different types of motorcycles. | | | | | |
| Objectives: | | | | | |
| <ul style="list-style-type: none"> To practice balancing and steering control To drive on plain road | | | | | |

| | <ul style="list-style-type: none"> To drive uphill and downhill To drive in severe condition To drive different types of motorcycle | | | | |
|----|---|---|-------------|------------|------------|
| | Module: This module consists of tasks and their related technical knowledge with time allocation for both the knowledge and performance aspects of the sub module. | | | | |
| | 6 hrs. (Th.) + 24 hrs. (Pr.) = 30 hrs. | | Time (hrs.) | | |
| SN | Module/tasks | Related technical knowledge | Th. | Pr. | Tot. |
| 1. | <ul style="list-style-type: none"> Practice balancing and steering control Drive on plain road Drive uphill and downhill Drive in severe condition Drive different types of motorcycle | <ul style="list-style-type: none"> <u>Balancing and steering control:</u> <ul style="list-style-type: none"> Concept and need of balance and steering control Principle and procedures for balancing and steering control Safety precautions and record-keeping <u>Driving on plain road:</u> <ul style="list-style-type: none"> Concept of plain/driving on plain road Procedures for driving on plain road Safety precautions and record-keeping <u>Driving uphill and downhill:</u> <ul style="list-style-type: none"> Concept of uphill and downhill /driving uphill and downhill Procedures for driving uphill and downhill Safety precautions and record-keeping <u>Driving in severe condition:</u> <ul style="list-style-type: none"> Concept of severe condition /driving in severe condition Procedures for driving in severe condition Safety precautions and records-keeping <u>Driving different types of motorcycle:</u> <ul style="list-style-type: none"> Concept of different types of motorcycle and their identification Procedures for driving of different types of motorcycle Safety precautions and records-keeping | 6 | 24 | 30 |
| | | Sub-total: | 6 | 24 | 30 |
| | | Total: | 75 | 315 | 390 |

| Module : 5 : Common module | | | | | | |
|---|---|---|-----|---|------|--|
| Description: This module consists of skills and knowledge related to applied math, occupational health and safety, HIV/AIDS, first aid, communication, and small business management applicable in the related job performances. | | | | | | |
| Objectives: After its completion the trainees will be able: <ul style="list-style-type: none"> • To carry out simple mathematical calculations related to the occupation • To be familiar with hazards related to this occupation • To apply preventive measures for occupational health and safety • To apply first aid measures • To apply preventive measures for HIV/AIDS • To communicate with others • To apply skills of small business management | | | | | | |
| Sub modules: <ol style="list-style-type: none"> 1. Applied math 2. Occupational health and safety 3. First aid 4. HIV/AIDS 5. Communication 6. Small business management | | | | | | |
| Sub module: 1:Applied math | | | | | | |
| Description: It consists of skills and knowledge related to mathematical calculations applicable in the related occupational performances. | | | | | | |
| Objective: After its completion the trainees will be able: <ul style="list-style-type: none"> • To carry out simple mathematical calculations that must be done for the effective performance in the occupational job. | | | | | | |
| Tasks: To fulfill the objective the trainees are expected to get proficiency on the following tasks/skills/steps together with their related technical knowledge: | | | | | | |
| | | | | Th. (4 hrs.) + Pr. (16hrs) = Tot. (20 hrs.) | | |
| | | | | Time (hrs.) | | |
| SN | Tasks or skills/ steps | Related technical knowledge | Th. | Pr. | Tot. | |
| 1. | Carry out simple addition applicable in job situation | <u>Addition:</u> <ul style="list-style-type: none"> • Concept • Simple calculations • Application in the occupation | 0.2 | 0.8 | 1 | |
| 2. | Carry out simple subtraction applicable in job situation | <u>Subtraction:</u> <ul style="list-style-type: none"> • Concept • Simple calculations • Application in the occupation | 0.2 | 0.8 | 1 | |
| 3. | Carry out simple multiplication applicable in job situation | <u>Multiplication</u> <ul style="list-style-type: none"> • Concept • Simple calculations • Application in the occupation | 0.2 | 0.8 | 1 | |
| 4. | Carry out simple division applicable in job situation | <u>Division:</u> <ul style="list-style-type: none"> • Concept • Simple calculations | 0.2 | 0.8 | 1 | |

| | | | | | |
|-----|--|--|-----|-----|---|
| | | <ul style="list-style-type: none"> • Application in the occupation | | | |
| 5. | Carry out measurements | <u>Measurement:</u> <ul style="list-style-type: none"> • Concept • Application in the occupation | 0.2 | 0.8 | 1 |
| 6. | Convert units of measurement | <u>Units of measurement:</u> <ul style="list-style-type: none"> • Concept • Units of measurement • Unit conversion • Application | 0.2 | 0.8 | 1 |
| 7. | Convert units of measuring temperature | <u>Units of measuring temperature:</u> <ul style="list-style-type: none"> • Concept • Units of temperature measurement • Unit conversion • Application | 0.2 | 0.8 | 1 |
| 8. | Calculate area | <u>Area:</u> <ul style="list-style-type: none"> • Concept • Formula • Calculation • Application | 0.2 | 0.8 | 1 |
| 9. | Calculate volume | <u>Volume:</u> <ul style="list-style-type: none"> • Concept • Formula • Calculation • Application | 0.2 | 0.8 | 1 |
| 10. | Calculate weight | <u>Weight:</u> <ul style="list-style-type: none"> • Concept • Formula • Calculation • Application | 0.2 | 0.8 | 1 |
| 11. | Calculate percentage | <u>Percentage:</u> <ul style="list-style-type: none"> • Concept • Formula • Calculation • Application | 0.2 | 0.8 | 1 |
| 12. | Calculate ratio and proportions | <u>Ratio and proportions:</u> <ul style="list-style-type: none"> • Concept • Formula • Calculation • Application | 0.2 | 0.8 | 1 |
| 13. | Apply Pythagoras formula | <u>Pythagoras formula:</u> <ul style="list-style-type: none"> • Concept • Formula • Calculation | 0.2 | 0.8 | 1 |

| | | | | | |
|--|------------------------------|---|----------|-----------|-----------|
| | | <ul style="list-style-type: none"> • Application | | | |
| 14. | Apply unitary method | <u>Unitary method:</u> <ul style="list-style-type: none"> • Concept • Calculation • Application | 0.2 | 0.8 | 1 |
| 15. | Calculate simple interest | <u>Simple interest:</u> <ul style="list-style-type: none"> • Concept • Formula • Calculation • Application | 0.2 | 0.8 | 1 |
| 16. | Calculate unit cost | <u>Unit cost:</u> <ul style="list-style-type: none"> • Concept • Formula • Calculation • Application | 0.2 | 0.8 | 1 |
| 17. | Calculate per unit income | <u>Per unit income:</u> <ul style="list-style-type: none"> • Concept • Formula • Calculation • Application | 0.2 | 0.8 | 1 |
| 18. | Calculate profit and loss | <u>Profit and loss:</u> <ul style="list-style-type: none"> • Concept • Formula • Calculation • Application | 0.2 | 0.8 | 1 |
| 19. | Perform billing | <u>Billing:</u> <ul style="list-style-type: none"> • Concept • Calculation • Bill format • Procedure • Application | 0.2 | 0.8 | 1 |
| 20. | Prepare simple balance sheet | <u>Balance sheet:</u> <ul style="list-style-type: none"> • Concept • Format • Procedure • Application | 0.2 | 0.8 | 1 |
| | Total: | | 4 | 16 | 20 |
| Sub module: 2: Occupational health and safety | | | | | |
| Description: It consists of skills and knowledge related to occupational health and safety applicable in the related occupational performances | | | | | |
| Objectives: After its completion the trainees will be able: <ul style="list-style-type: none"> • To be familiar with hazards related to this occupation • To apply preventive measures for occupational health and safety | | | | | |
| Tasks: To fulfill the objective the trainees are expected to get proficiency on the | | | | | |

| following tasks/skills/steps together with their related technical knowledge: | | | | | |
|---|--|--|----------|-------------|----------|
| Th. (2 hrs.) + Pr. (8hrs) = Tot. (10 hrs.) | | | | Time (hrs.) | |
| SN | Tasks or skills/ steps | Related technical knowledge | Th. | Pr. | Tot. |
| Be familiar with hazards related to this occupation | | | | | |
| 1. | Be familiar with accident hazards | <u>Accident hazards:</u> <ul style="list-style-type: none"> • Concept • Causes • Procedures for managing this hazard | 0.2 | 0.8 | 1 |
| 2. | Be familiar with physical hazards | <u>Physical hazards:</u> <ul style="list-style-type: none"> • Concept • Causes • Procedures for managing this hazard | 0.2 | 0.8 | 1 |
| 3. | Be familiar with chemical hazards | <u>Chemical hazards:</u> <ul style="list-style-type: none"> • Concept • Causes • Procedures for managing this hazard | 0.2 | 0.8 | 1 |
| 4. | Be familiar with biological hazards | <u>Biological hazards:</u> <ul style="list-style-type: none"> • Concept • Causes • Procedures for managing this hazard | 0.2 | 0.8 | 1 |
| 5. | Be familiar with ergonomic/psychological / organizational factors: | <u>Ergonomic /psychological / organizational factors:</u> <ul style="list-style-type: none"> • Concept of : <ul style="list-style-type: none"> ▪ Ergonomic factors ▪ Psychological factors ▪ organizational factors • Procedures for managing hazards caused by these factors | 0.2 | 0.8 | 1 |
| Sub-total: | | | 1 | 4 | 4 |
| Apply preventive measures for occupational health and safety | | | | | |
| 1. | Wear safety wares | <u>Safety wares:</u> <ul style="list-style-type: none"> • Identification • Needs • Wearing procedures | 0.2 | 0.5 | 0.7 |
| 2. | Inspect workplace before working | <u>Workplace inspection:</u> <ul style="list-style-type: none"> • Concept • Principle and procedures • Records keeping | 0.2 | 0.5 | 0.7 |
| 3. | Inspect tools/materials/equipment before use | <u>Inspection of tools/materials/equipment:</u> <ul style="list-style-type: none"> • Concept and identification | 0.1 | 0.5 | 0.6 |

| | | | | | |
|--|--|--|---|----------|-----------|
| | | <ul style="list-style-type: none"> • Principle and procedures • Records keeping | | | |
| 4. | Be prevented from accident hazards | <u>Prevention of accident hazards:</u> <ul style="list-style-type: none"> • Concept • Being prevented from accident hazards • Records keeping | 0.1 | 0.5 | 0.6 |
| 5. | Be prevented from physical hazards | <u>Prevention of physical hazards:</u> <ul style="list-style-type: none"> • Concept • Being prevented from physical hazards • Records keeping | 0.1 | 0.5 | 0.6 |
| 6. | Be prevented from chemical hazards | <u>Prevention of chemical hazards:</u> <ul style="list-style-type: none"> • Concept • Being prevented from chemical hazards • Records keeping | 0.1 | 0.5 | 0.6 |
| 7. | Be prevented from biological hazards | <u>Prevention of biological hazards:</u> <ul style="list-style-type: none"> • Concept • Being prevented from biological hazards • Records keeping | 0.1 | 0.5 | 0.6 |
| 8. | Be prevented from ergonomic/psychological / organizational factors that create problems/hazards. | <u>Prevention of ergonomic/psychological / organizational factors that create problems/hazards:</u> <ul style="list-style-type: none"> • Concept • Being prevented from ergonomic/psychological / organizational factors that create problems/hazards • Records keeping | 0.1 | 0.5 | 0.6 |
| | Sub-total: | | 1 | 4 | 5 |
| | Total: | | 2 | 8 | 10 |
| Sub module: 3: First aid | | | | | |
| Description: It consists of skills and knowledge related to first aid measures applicable in the related occupational performances. | | | | | |
| Objective: After its completion the trainees will be able: <ul style="list-style-type: none"> • To apply first aid measures | | | | | |
| Tasks: To fulfill the objective the trainees are expected to get proficiency on the following tasks/skills/steps together with their related technical knowledge: | | | | | |
| | | | Th. (1 hrs.) + Pr. (4hrs) = Tot. (5 hrs.) | | |
| | | | Time (hrs.) | | |
| SN | Tasks or skills/ steps | Related technical knowledge | Th. | Pr. | Tot. |
| 1. | Carryout simple dressings | <u>Carryout simple dressings:</u> <ul style="list-style-type: none"> • Concept | 0.10 | 0.40 | 0.5 |

| | | | | | |
|----|--|---|------|------|------|
| | | <ul style="list-style-type: none"> • Needs • Procedures • Precautions • Recording | | | |
| 2. | Apply simple bandages | <u>Apply simple bandages:</u> <ul style="list-style-type: none"> • Concept • Needs • Procedures • Precautions • Recording | 0.10 | 0.40 | 0.5 |
| 3. | Apply first aid for simple wounds | <u>Apply first aid for simple wounds:</u> <ul style="list-style-type: none"> • Concept • Needs • Procedures • Precautions • Recording | 0.10 | 0.40 | 0.5 |
| 4. | Apply first aid for heat /chemical burns | <u>Apply first aid for heat /chemical burns:</u> <ul style="list-style-type: none"> • Concept • Needs • Procedures • Precautions • Recording | 0.10 | 0.40 | 0.5 |
| 5. | Apply first aid for injuries/cuts | <u>Apply first aid for injuries/cuts:</u> <ul style="list-style-type: none"> • Concept • Needs • Procedures • Precautions • Recording | 0.10 | 0.40 | 0.5 |
| 6. | Apply first aid for fracture | <u>Apply first aid for fracture:</u> <ul style="list-style-type: none"> • Concept • Needs • Procedures • Precautions • Recording | 0.10 | 0.40 | 0.5 |
| 7. | Apply first aid for simple bleeding | <u>Apply first aid for simple bleeding:</u> <ul style="list-style-type: none"> • Concept • Needs • Procedures • Precautions • Recording | 0.10 | 0.40 | 0.5 |
| 8. | Apply first aid for insect bites | <u>Apply first aid for insect bites:</u> <ul style="list-style-type: none"> • Concept • Needs | 0.05 | 0.20 | 0.25 |

| | | | | | |
|--------------------------------|--|---|----------|----------|----------|
| | | <ul style="list-style-type: none"> • Procedures • Precautions • Recording | | | |
| 9. | Apply first aid for animal bites | <u>Apply first aid for animal bites:</u> <ul style="list-style-type: none"> • Concept • Needs • Procedures • Precautions • Recording | 0.05 | 0.20 | 0.25 |
| 10. | Apply first aid for frost bite | <u>Apply first aid for frost bite :</u> <ul style="list-style-type: none"> • Concept • Needs • Procedures • Precautions • Recording | 0.05 | 0.20 | 0.25 |
| 11. | Apply first aid for simple poisoning | <u>Apply first aid for simple poisoning:</u> <ul style="list-style-type: none"> • Concept • Needs • Procedures • Precautions • Recording | 0.05 | 0.20 | 0.25 |
| 12. | Apply first aid for electrical shock | <u>Apply first aid for electrical shock:</u> <ul style="list-style-type: none"> • Concept • Needs • Procedures • Precautions • Recording | 0.05 | 0.20 | 0.25 |
| 13. | Apply first aid for choking/drowning | <u>Apply first aid for choking/drowning:</u> <ul style="list-style-type: none"> • Concept • Needs • Procedures • Precautions • Recording | 0.05 | 0.20 | 0.25 |
| | Total: | | 1 | 4 | 5 |
| Sub module: 4: HIV/AIDS | | | | | |
| | Description: It consists of skills and knowledge related to safety measures to be followed for the prevention of HIV/AIDS including its management. | | | | |
| | Objectives: After its completion the trainees will be able: <ul style="list-style-type: none"> • To state the concept of HIV/AIDS • To apply safety measures for prevention of HIV/AIDS | | | | |
| | Tasks: To fulfill the objective the trainees are expected to get proficiency on the following tasks/skills/steps together with their related technical | | | | |

| knowledge: | | Th.(1 hrs) + Pr.(4hrs) = Tot.(5 hrs) | | | Time(hrs) | | |
|------------|---|---|-----|-----|-------------|--|--|
| SN | Tasks or skills/ steps | Related technical knowledge | Th. | Pr. | Tot. | | |
| 1. | State the concept of HIV/AIDS 1. Define HIV 2. Enlist modes of transmission of HIV 3. Enlist signs and symptoms of HIV infected person 4. Enlist stages of HIV 5. Define AIDS 6. Enlist signs and symptoms of AIDS 7. Enlist current status of global HIV/AIDS 8. Enlist difference between HIV/AIDS | State the concept of HIV/AIDS: <u>HIV:</u> <ul style="list-style-type: none"> • Definition of HIV: • Modes of transmission of HIV • Signs and symptoms of HIV infected person • Stages of HIV <u>AIDS:</u> <ul style="list-style-type: none"> • Definition of AIDS • Signs and symptoms of AIDS • Current status of global HIV/AIDS • Difference between HIV and AIDS | 0.5 | 2 | 2.5 | | |
| 2. | Apply safety measures for prevention of HIV/AIDS: 1. Keep touch with single partner for sexual intercourse 2. Ensure safe intercourse 3. Use condom carefully and consistently during each act of sexual intercourse incase of other than single sex partner 4. Keep away from sharing syringes, needles and other skin piercing instrument with HIV infected people 5. Keep away from sharing toothbrushes, blade razors or other instruments that could become contaminated from blood 6. Keep away from handling clothes or cloths that are visibly contaminated with blood 7. Follow positive health behavior 8. Get blood be tested to ensure HIV negative/positive | <u>Apply safety measures for prevention of HIV/AIDS:</u> <ul style="list-style-type: none"> • Keeping touch with single partner for sexual intercourse • Ensuring safe intercourse • Using condom carefully and consistently during each act of sexual intercourse incase of other than single sex partner • Keeping away from sharing syringes, needles and other skin piercing instrument with HIV infected people • Keeping away from sharing toothbrushes, blade razors or other instruments that could become contaminated from blood • Keeping away from handling clothes or cloths that are visibly contaminated with blood • Positive health behavior • Getting blood be tested to ensure HIV negative/positive | 0.5 | 2 | 2.5 | | |

| | Total: | | 1 | 4 | 5 |
|---|---|---|--|-----|------|
| Sub module: 5 : Communication | | | | | |
| Description: It consists of the skills and knowledge related to communication in the related occupation. Each task consists of its steps, related technical knowledge and hour distribution. | | | | | |
| Objectives: After its completion the trainees will be able: | | | | | |
| | <ul style="list-style-type: none"> • To handle telephone calls • To handle fax • To handle mail • To write letters • To write memos / tips / notes / notice • To perform internal communication • To perform external communication • To perform oral communication • To perform written communication | <ul style="list-style-type: none"> • To communicate with donors To communicate with financial institutes • To link with media • To disseminate information • Write job application • Prepare Resume. • Communicate with senior. • Communicate with juniors. • Deal with customers • Request / purchase tool, supplies, materials and equipment. • Fill up leave requisition form. | | | |
| Tasks: To fulfill the objective the trainees are expected to get proficiency on the following tasks/skills/steps together with their related technical knowledge: | | | | | |
| | | | Th. (2 hrs.) + Pr. (8hrs) = Tot. (10 hrs.) | | |
| | | | Time (hrs.) | | |
| SN | Tasks or skills/ steps | Related technical knowledge | Th. | Pr. | Tot. |
| 1. | Handle telephone calls | <u>Handling telephone calls:</u> <ul style="list-style-type: none"> • Concept, need, and importance • Operating principles and procedures • Care and maintenance • Safety precautions to be taken • Keeping activity records | 0.1 | 0.4 | 0.5 |
| 2. | Handle fax | <u>Handling fax:</u> <ul style="list-style-type: none"> • Concept, need, and importance • Operating principles and procedures • Care and maintenance • Safety precautions to be taken • Keeping activity records | 0.1 | 0.4 | 0.5 |
| 3. | Handle mail | <u>Handling mail:</u> <ul style="list-style-type: none"> • Concept, need, and importance • Operating principles and procedures • Care and maintenance • Safety precautions to be taken | 0.1 | 0.4 | 0.5 |

| | | | | | |
|----|--|--|-----|-----|-----|
| | | <ul style="list-style-type: none"> • Keeping activity records | | | |
| 4. | Write letters | <u>Writing letters:</u> <ul style="list-style-type: none"> • Concept, need, and importance • Types of letter • Component parts of each type of letter • Format of each type of letter • Writing letters • Precautions to be taken • Keeping activity records | 0.1 | 0.4 | 0.5 |
| 5. | Write memos / tips / notes / notice | <u>Writing memos / tips / notes / notice:</u> <ul style="list-style-type: none"> • Concept, need, and importance • Component parts of memos / tips / notes / notice • Format of memos / tips / notes / notice • Writing memos / tips / notes / notice • Precautions to be taken • Keeping activity records | 0.1 | 0.4 | 0.5 |
| 6. | Prepare simple report | <u>Preparing simple report:</u> <ul style="list-style-type: none"> • Concept, need, and importance • Component parts of a report • Format of a report • Writing a report • Precautions to be taken • Keeping activity records | 0.1 | 0.4 | 0.5 |
| 7. | Prepare simple proposal | <u>Preparing simple proposal:</u> <ul style="list-style-type: none"> • Concept, need, and importance • Component parts of a proposal • Format of a proposal • Writing a proposal • Precautions to be taken • Keeping activity records | 0.1 | 0.4 | 0.5 |
| 8. | Perform internal/ external communication | <u>Performing internal/ external communication:</u> <ul style="list-style-type: none"> • Concept, need, and importance • Principles, procedures, and application • Performing internal/ external communication • Precautions to be taken • Keeping activity records | 0.1 | 0.4 | 0.5 |
| 9. | Perform horizontal/vertical | <u>Performing horizontal/vertical</u> | 0.1 | 0.4 | 0.5 |

| | | | | | |
|------------|---------------------------------------|--|-----|-----|-----|
| | communication | <u>communication:</u> <ul style="list-style-type: none"> • Concept, need, and importance • Principles, procedures, and application • Performing horizontal/vertical communication • Precautions to be taken • Keeping activity records | | | |
| 10. | Perform oral/ written communication | <u>Performing oral/ written communication:</u> <ul style="list-style-type: none"> • Concept, need, and importance • Principles, procedures, and application • Performing oral/ written communication • Precautions to be taken • Keeping activity records | 0.1 | 0.4 | 0.5 |
| 11. | Communicate with financial institutes | <u>Communicating with financial institutes:</u> <ul style="list-style-type: none"> • Concept, need, and importance • Principles, procedures, and application • Communicating with financial institutes • Precautions to be taken • Keeping activity records | 0.1 | 0.4 | 0.5 |
| 12. | Link with media | <u>Linking with media:</u> <ul style="list-style-type: none"> • Concept, need, and importance • Principles, procedures, and application • Linking with media • Precautions to be taken • Keeping activity records | 0.1 | 0.4 | 0.5 |
| 13. | Disseminate information | <u>Disseminating information:</u> <ul style="list-style-type: none"> • Concept, need, and importance • Principles, procedures, and application • Disseminating information • Precautions to be taken • Keeping activity records | 0.1 | 0.4 | 0.5 |
| 14. | Write job application | <u>Writing job application:</u> <ul style="list-style-type: none"> • Concept, need, and importance • Component parts of job application | 0.1 | 0.4 | 0.5 |

| | | | | | |
|-----|---|--|-----|-----|-----|
| | | <ul style="list-style-type: none"> • Format of job application • Writing job applications • Precautions to be taken • Keeping activity records | | | |
| 15. | Prepare resume | <u>Preparing resume:</u> <ul style="list-style-type: none"> • Concept, need, and importance • Component parts of a resume • Format of a resume • Writing resume • Precautions to be taken • Keeping activity records | 0.1 | 0.4 | 0.5 |
| 16. | Communicate with senior. | <u>Communicating with senior:</u> <ul style="list-style-type: none"> • Concept, need, and importance • Principles, procedures, and application • Communicating with senior • Precautions to be taken • Keeping activity records | 0.1 | 0.4 | 0.5 |
| 17. | Communicate with juniors. | <u>Communicating with juniors:</u> <ul style="list-style-type: none"> • Concept, need, and importance • Principles, procedures, and application • Precautions to be taken • Keeping activity records | 0.1 | 0.4 | 0.5 |
| 18. | Deal with customers/stake holders | <u>Dealing with customers/stake holders:</u> <ul style="list-style-type: none"> • Concept, need, and importance • Principles, procedures, and application • Communicating with juniors • Precautions to be taken • Keeping activity records | 0.1 | 0.4 | 0.5 |
| 19. | Request / purchase tool, supplies, materials and equipment. | <u>Requesting / purchasing tool, supplies, materials and equipment:</u> <ul style="list-style-type: none"> • Concept, need, and importance • Principles, procedures, and application • Requesting / purchasing tool, supplies, materials and equipment • Precautions to be taken • Keeping activity records | 0.1 | 0.4 | 0.5 |
| 20. | Fill up leave requisition form | <u>Filling up leave requisition form:</u> <ul style="list-style-type: none"> • Concept, need, and importance | 0.1 | 0.4 | 0.5 |

| | | <ul style="list-style-type: none"> Principles, procedures, and application Filling up leave requisition form Precautions to be taken Keeping activity records | | | |
|--|--|---|-------------|----------|-----------|
| | | Total: | 2 | 8 | 10 |
| Sub module: 6 : Small enterprise development | | | | | |
| Description: It consists of the skills and knowledge related to small enterprise development in the related occupation. Each task consists of its steps, related technical knowledge and hour distribution. | | | | | |
| Objectives: After its completion the trainees will be able: <ul style="list-style-type: none"> To be familiar with entrepreneurship development To prepare a business plan | | | | | |
| Tasks: To fulfill the objective the trainees are expected to get proficiency on the following tasks/skills/steps together with their related technical knowledge: | | | | | |
| Th. (4 hrs.) + Pr. (16 hrs.) = Tot. (20 hrs.) | | | Time (hrs.) | | |
| SN | Tasks or skills/ steps | Related technical knowledge | Th. | Pr. | Tot. |
| | <u>Entrepreneurship development:</u> | <u>Entrepreneurship development:</u> | | | |
| 1. | Be familiar with business / entrepreneurship | <u>Business / entrepreneurship:</u> <ul style="list-style-type: none"> Concept, definitions, need, and importance Precautions to be taken Keeping activity records | 0.1 | 0.4 | 0.5 |
| 2. | Develop qualities of a successful entrepreneur | <u>Qualities of a successful entrepreneur:</u> <ul style="list-style-type: none"> Concept and needs Qualities of a successful entrepreneur Keeping activity records | 0.1 | 0.4 | 0.5 |
| 3. | Follow professional ethics | <u>Professional ethics:</u> <ul style="list-style-type: none"> Concept, need, and importance Professional ethics Interpretation Precautions to be taken Keeping activity records | 0.1 | 0.4 | 0.5 |
| 4. | Analyze prevailing rules / regulations/ laws /acts related to the profession | <u>Prevailing rules / regulations/ laws /acts related to the profession:</u> <ul style="list-style-type: none"> Concept, need, and importance Prevailing rules / regulations/ laws /acts related to the profession Interpretation Precautions to be taken | 0.1 | 0.4 | 0.5 |

| | | | | | |
|----|--|--|-----|-----|-----|
| | | <ul style="list-style-type: none"> • Keeping activity records | | | |
| 5. | Develop skills of good governance | <u>Good governance:</u> <ul style="list-style-type: none"> • Concept, need, and importance • Principles and procedures of good governance • Precautions to be taken • Keeping activity re | 0.1 | 0.4 | 0.5 |
| 6. | Be familiar with entrepreneurship development/ factors affecting the growth of entrepreneurship | <u>Entrepreneurship development/ factors affecting the growth of entrepreneurship:</u> <ul style="list-style-type: none"> • Concept, need, and importance • Entrepreneurship development • Factors affecting the growth of entrepreneurship • Precautions to be taken • Keeping records | 0.1 | 0.4 | 0.5 |
| 7. | Develop an entrepreneurship competency development [ECD] program | <u>Entrepreneurship competency development [ECD] program:</u> <ul style="list-style-type: none"> • Concept, need, and importance • Entrepreneurship competency development [ECD] • ECD program development • Precautions to be taken • Keeping records | 0.1 | 0.4 | 0.5 |
| 8. | Be familiar with identification / selection/appraising/gaining instructional a support of a project <ul style="list-style-type: none"> • Be familiar with identification of a project • Be familiar with selection of a project • Be familiar with appraising of a project • Be familiar with gaining instructional a support of a project | <u>Identification / selection/appraising/gaining instructional a support of a project:</u> <ul style="list-style-type: none"> • Concept, need, and importance • Identification of a project • Selection of a project • Appraising of a project • Gaining instructional a support of a project • Precautions to be taken • Keeping records | 0.1 | 0.4 | 0.5 |
| 9. | Be familiar with the preparation of a comprehensive business plan for starting / acquiring /running a business | <u>Be familiar with the preparation of a comprehensive business plan for starting / acquiring /running a business:</u> <ul style="list-style-type: none"> • Preparation of a comprehensive business plan for starting a business • Preparation of a comprehensive | 0.1 | 0.4 | 0.5 |

| | | | | | |
|------------|--|--|----------|----------|----------|
| | | business plan for acquiring a business <ul style="list-style-type: none"> • Preparation of a comprehensive business plan for running a business • Precautions to be taken • Keeping records | | | |
| 10. | Be familiar with marketing of products | <u>Be familiar with marketing of products:</u> <ul style="list-style-type: none"> • Concept of product, price, place, promotion • marketing of products • Precautions to be taken • Keeping records | 0.1 | 0.4 | 0.5 |
| | | Sub-total: | 1 | 4 | 5 |
| | <u>Business plan:</u> | <u>Business plan:</u> | | | |
| 11. | Collect related information / data | <u>Collecting related information / data:</u> <ul style="list-style-type: none"> • Concept, need, and importance of data and information • Difference between data and information • Principles and procedures for collecting related information / data • Collecting related information / data • Precautions to be taken • Keeping records | 0.4 | 1.6 | 2 |
| 12. | Prepare production plan | <u>Preparing production plan:</u> <ul style="list-style-type: none"> • Concept, need, and importance • Component parts • Format • Principles and procedures • Precautions to be taken • Keeping records | 0.4 | 1.6 | 2 |
| 13. | Prepare cost plan | <u>Preparing cost plan:</u> <ul style="list-style-type: none"> • Concept, need, and importance • Component parts • Format • Principles and procedures • Precautions to be taken • Keeping records | 0.4 | 1.6 | 2 |
| 14. | Prepare financial plan | <u>Preparing financial plan:</u> <ul style="list-style-type: none"> • Concept, need, and importance | 0.4 | 1.6 | 2 |

| | | | | | |
|---------------------------|---|--|--|------------|------------|
| | | <ul style="list-style-type: none"> • Component parts • Format • Principles and procedures • Precautions to be taken • Keeping records | | | |
| 15. | Prepare marketing plan | <u>Preparing marketing plan:</u> <ul style="list-style-type: none"> • Concept, need, and importance • Component parts • Format • Principles and procedures • Precautions to be taken • Keeping records | 0.4 | 1.6 | 2 |
| 16. | Prepare a business plan | <u>Preparing a business plan:</u> <ul style="list-style-type: none"> ❖ Concept, need, and importance • Component parts • Format • Principles and procedures • Precautions to be taken • Keeping records | 0.6 | 2.4 | 3 |
| 17. | Appraise business plan | <u>Appraising business plan:</u> <ul style="list-style-type: none"> • Concept, need, and importance • Principles and procedures • Precautions to be taken • Keeping records | 0.4 | 1.6 | 2 |
| | | Sub-total: | 3 | 12 | 15 |
| | | | Total: | 4 | 16 |
| | | | Common module total: | 14 | 56 |
| | | | All total: | 78 | 312 |
| | | | | 390 | |
| Tools and machines | | | | | |
| | Hand Tools <ul style="list-style-type: none"> • Wrenches: <ul style="list-style-type: none"> 🔧 Open Wrench 🔧 Combination Wrench 🔧 Ring wrench 🔧 adjustable wrench 🔧 socket wrench 🔧 'T' wrench • Pliers: <ul style="list-style-type: none"> 🔧 Combination plier 🔧 Nose plier 🔧 Circlip plier (inner and outer) 🔧 Vice plier 🔧 Monkey plier 🔧 Cutting plier | <ul style="list-style-type: none"> • Hack saw • Chisel • Punch • scraper • Scriber • File • Plug wrench Measuring tools <ul style="list-style-type: none"> • Torque wrench • vernier caliper and macro meter • feeler gauge • Hydro meter • ammeter • Volt Meter | <ul style="list-style-type: none"> • Valve lifter • Clutch Holder • Shock Holder • Tappet Adjuster • Tire level • Lapping stick Machines <ul style="list-style-type: none"> • Air compressor • Battery Charger • Drill Machine • Grinding Machine | | |

| | | |
|--|--|---|
| <ul style="list-style-type: none"> • Screw Drivers: <ul style="list-style-type: none"> ✚ Plus (star) screw driver ✚ Minus (Phillips) screw driver • Hammer (Soft and hard) • 'L' Key | <ul style="list-style-type: none"> • Multi-meter (Digital) • Air pressure gauge • Engine compression tester • Timing light • Taco meter Special tools: <ul style="list-style-type: none"> • Magnet Puller | <ul style="list-style-type: none"> • Welding Machine • Washing Machine Set. • Spark plug and tester. |
| Reading materials | | |
| <ul style="list-style-type: none"> • Instructor selected related text and reference books | <ul style="list-style-type: none"> • Instructor prepared notes, handouts, and manuals | |
| Facilities | | |
| <ul style="list-style-type: none"> • Administrative rooms • Sufficient class rooms • Mechanical workshop/Motorcycle servicing workshop • Store / Library | <ul style="list-style-type: none"> • Canteen & Hostel (optional) • Computers/Telephone • Water supply facility • Electricity supply facility • Vehicle (available to use) | |

Appendices

Module: 1: Motorbike service and beginner mechanic

Sub module: 1: Servicing

1. Follow safety rules
2. Identify/handle tools/equipment
3. Read/interpret service manual
4. Wash the motorbike
5. Check/adjust clutch
6. Check/adjust throttle grip
7. Check /adjust brake
8. Adjust / clean drive chain
9. Check/adjust air pressure
10. Check silencer
11. Clean air filter
12. Clean petrol tank
13. Clean and adjust spark plug
14. Change/replace engine oil
15. Change fork oil
16. Check electrical problems
17. Recharge the battery
18. Check/replace wheel rim and bearing
19. Check/adjust valve clearance
20. Check/clean oil pump tank(2-stroke)
21. Clean carburetor
22. Check all faults
23. Keep records

Sub module: 2: Chassis

1. Check/change suspension bush rod
2. Check/repair single/double stand
3. Change foot rest rubber
4. Check/repair/replace handle bar
5. **Inspect**/replace steering **race ball** /bearing(**cone beating**)
6. Change clutch/brake yoke
7. **Inspect** chassis condition
8. Check /replace tire
9. Repair/**replace** tube
10. Check and change **drive chain**/sprocket

Sub module: 3: Suspension system

1. Inspect/change fork oil seal/**oil/dust boot**

2. Check/change rear shock absorber
3. Check/change front fork components
4. Check/change fork spring
5. Inspect/repair/replace swing arm/bushes

Sub module: 4: Brake and control

1. Check/change brake cable
2. Check/change clutch cable
3. Check/change speedometer cable
4. Check/change speedometer gear
5. Check/change front brake drum and brake shoe
6. Check/change rear brake drum and brake shoe
7. Check/change disc brake and brake pad/caliper
8. Repair/replace hydraulic brake(master cylinder/wheel cylinder kit)

Sub module: 5: Fuel supply system

1. Clean tank and on/off switch/fuel cock
2. Inspect/change oil seals/O-ring
3. Check petrol pipe
4. Clean/ check petrol filter
5. Service/repair carburetor
6. Inspect /replace carburetor kit
7. Replace throttle valve
8. Clean/adjust float
9. Service/replace electric fuel injection system
10. Tune up the carburetor

Module: 2: Motorbike Electrical Mechanic

Sub module: 1: General wiring

1. Check/replace fuse
2. Check/repair wiring condition

Sub module: 2: Motorbike lighting and signaling system

1. Check/replace bulbs and indicating lamp
2. Align head light
3. Check/replace/repair horn
4. Check/replace flasher relay
5. Adjust/replace brake light switch
6. Repair/replace digital display unit

Sub module: 3: Charging and starting system

1. Check/maintain battery condition

2. Recharge battery
3. Check/replace rectifier/regulator or regulator – rectifier unit
4. Check/replace flywheel magneto alternator
5. Check/repair/replace **charging and lighting coil**
6. Check/repair replace **self**-starting system

Sub module: 4: Ignition system

1. Check/replace ignition coil
2. Check/replace spark plug
3. Check/adjust ignition timing
4. Maintain breaker point ignition unit
5. Check/replace electronic ignition (CDI) unit
6. Check/adjust ignition timing
7. **Check/replace source/pick up coil**

Module: 3: Motorbike Engine and Transmission Mechanic

Sub module: 1: two stroke engine

1. Remove and reinstall the engine
2. **Decarbonize** cylinder head
3. **Inspect** cylinder
4. Remove/replace piston
5. Inspect/replace piston ring set
6. Change connecting rod set
7. Change piston pin
8. Change crank bearing
9. Change gasket set

Sub module: 2: Clutch and gear system

1. Change clutch plate/friction plate
2. Change clutch assembly
3. Remove/check/replace gear assembly
4. Check/replace gear shaft fork
5. Check/replace shift cam(**gear drum**)
6. Change kick starter
7. Check/replace gear **shifting shaft and lever**

Sub module: 3: Lubrication system

1. Check/change oil **filter and** pump
2. Check/change oil pump gear/sprocket

Sub module: 4: Four stroke engine

1. Remove/repair/**install** cylinder head
2. **Inspect** rocker arm

3. **Inspect** rocker arm pin
4. **Inspect** push rod
5. **Inspect/replace valves**
6. Repair valve guide
7. **Perform** valve seat inspection / **lapping**
8. Change valve spring and valve oil seal
9. Inspect/change cam shaft
10. Set valve timing
11. Adjust tappet clearance
12. Measure engine components (piston/rings/cylinder/ piston pins/crank)

Module: 4: Motorcycle Driving

1. Practice balancing and steering control
2. Drive on plain road
3. Drive uphill and downhill
4. Drive in severe condition
5. Drive different types motorcycle