

ENGINEERING

- 1. Automobile Engineering Technician**
- 2. Air conditioning & Refrigeration**
- 3. Building Construction**
- 4. Radio & TV Technician**

1. AUTOMOBILE ENGINEERING TECHNICIAN

1. INTRODUCTION

The objectives of Vocational Education in the context of fulfillment of national goal are to train the students for self-employment. Automobile Engineering Technician can have ample opportunities if skills are learned with commitment.

2. OBJECTIVES OF THE COURSE

1. To get knowledge and skills of an Automobile. [2 wheeler]
2. Know the faults and causes and able to rectify.

3. SKILLS TO BE PROVIDED

1. Use proper tools for repair work.
2. Able to assemble and disassemble the parts of the 2 wheelers.
3. Able to identify the various faults and to rectify.

4. EMPLOYMENT OPPORTUNITIES

1. Able to seek employment as a Technician in any Automobile concern.
2. Able to start a repair shop and repair motorized 2 wheelers.

5. Schemes Of Instruction Per Module

Module	Theory		On Job Training		Total	
	Hours	Weightage	Hours	Weightage	Hours	Weightage
I	72	30	216	70	288	100
Total	72	30	216	70	288	100

Schemes Of Instruction Per Week

Module	Theory	On the Job Training	Total
Modules I/II/III	6 Hours	18 Hours	24 Hours

6. SYLLABUS

MODULE : I : TWO WHEELER MECHANISM

WEEK. NO	THEORY	ON THE JOB TRAINING
1	Construction and working of spark ignition, 2-stroke and 4-stroke engine. Comparison of two and four stroke spark ignition engine.	Study the working of two and four stroke spark ignition engine with the help of a sectional model. Dismantling the two and four stroke engine, cleaning and inspecting the parts and also reassembling the (working model) engine.
2	Construction and working of two and four stroke spark ignition engine parts i.e. Cylinders head, Cylinder, Piston, Connecting rod, Crank Shaft, Dry sump, Wet sump, Spark Plug, Carburetor.	Cleaning the spark plug, setting the spark plug gap or replacing the spark plug with new one. Dismantling the carburetor cleaning and inspecting the parts and also reassembling the parts. Fixing the carburetor on engine.
3	Construction and working of Air cleaners, Silencers, Mufflers (two Wheelers only). Necessity of cooling system, Study air cooling system, advantages and disadvantages of air cooling system.	Dismantling the air cleaner, cleaning, inspecting, setting and refitting to the vehicle. Dismantling the manifolds and muffler. Cleaning, inspecting, setting and refitting to the vehicle.
4	Necessity of lubricating system, Study the splash type and pressure lubrication system. Types of oils, which are, used in two-wheeler engines.	Faultfinding and rectification in lubrication system. Inspecting the lubricating system, changing of oil filters.
5	Necessity of Ignition system, construction and working of magneto ignition system. Detailed study of two-wheeler automobile wiring circuits. Starting motor- motor working principle construction and function of the battery.	Cleaning and testing of ignition system. Removing the contact breaker points, setting the ignition timing and C. B. point gap or replacing with new contact breaker points. Removing the battery, Checking the electrolyte, Specific gravity and reconnecting. Faultfinding and rectification of magneto ignition system. Fault finding and rectification of ignition and Lighting circuit. Faultfinding and rectification in starting motor.
6	Function of clutch, principle of operation, centrifugal, semi centrifugal, and multiple clutches construction, working, servicing and maintenance.	Explaining where it is used and finding faults in its operation. Dismantling the clutch, checking for wear and tear, cleaning injecting and reassembling with new clutches.
7		To study about gearbox.

8	<p>Gear box, types of gears, types of gear boxes i.e., sliding mesh gear box and constant mesh gear box. Necessity of gear box and lubrication of gear box.</p> <p>Functions of shock absorbers and telescope shock absorbers. Transmission of power-chain drive, belt drive and their functions.</p>	<p>Dismantling the gearbox. Cleaning, inspecting and reassembling.</p> <p>Fault finding and rectifying suspension springs. Dismantling of shock absorber, inspecting replacing with new springs, oil seals and oils. Dismantling both front and rear chain sprockets, cleaning inspecting of necessary replacing with new ones and reassembling.</p>
9	<p>Braking principles, Mechanical brakes and disc brakes. Requirements of good braking system and maintenance of brakes.</p>	<p>Dismantling of both front and rear brakes, Cleaning, inspecting and refitting.</p>
10	<p>Two wheeler service station lay out, factors effecting service station. Two wheeler maintenance - servicing and maintenance of two stroke and four stroke engines.</p>	<p>To study about the service station setup. To study about 2 wheeler maintenance.</p>
11	<p>Tool kit of mechanics, service station tools and special tools. Raw materials, consumables, kerosene, Cotton waste, grease, engine oil.</p>	<p>What are the tools used where they are used are studied in detail. To study about raw materials.</p>
12	<p>Revision and Tests</p>	<p>Revision through OJT.</p>

MODULE: II: THREE WHEELER MECHANISM

WEEK. NO	THEORY	ON THE JOB TRAINING
1	<p>Construction and working of spark ignition, and C.I., 2-stroke and 4-stroke engine. Comparison of two and four stroke spark ignition engine and C.I.engine.</p>	<p>Study the working of two and four stroke spark ignition and C.I.engine with the help of a sectional model. Dismantling the two and four stroke engine, cleaning and inspecting the parts and also reassembling the (working model) engine.</p>
2	<p>Construction and working of two and four stroke spark ignition and C.I. engine parts i.e., Cylinders head, Cylinder, Piston, Connecting rod, Crank Shaft, Dry sump, Wet sump, Spark Plug, Carburetor.</p>	<p>Cleaning the spark plug, setting the spark plug gap or replacing the spark plug with new one. Dismantling the carburetor cleaning and inspecting the parts and also reassembling the parts. Fixing the carburetor on engine.</p>
3	<p>Construction and working of Air cleaners, Silencers, Mufflers (three Wheelers only).</p>	<p>Dismantling the air cleaner, cleaning, inspecting, setting and refitting to the vehicle.</p>

	Necessity of cooling system, Study air cooling system, advantages and disadvantages of air cooling system.	Dismantling the manifolds and muffler. Cleaning, inspecting, setting and refitting to the vehicle.
4	Necessity of lubricating system, Study the splash type and pressure lubrication system. types of oils which are used in two wheeler engines.	Fault finding and rectification in lubrication system. Inspecting the lubricating system, changing of oil filters.
5	Necessity of Ignition system, construction and working of magneto and battery ignition system. Detailed study of three wheeler automobile wiring circuits. Starting motor- motor working principle construction and function of the battery.	Cleaning and testing of ignition system. Removing the contact breaker points, setting the ignition timing and C.B point gap or replacing with new contact breaker points. Removing the battery, Checking the electrolyte, Specific gravity and reconnecting. Fault finding and rectification of magneto ignition system. Fault finding and rectification of ignition and Lighting circuit. Fault finding and rectification in starting motor.
6	Function of clutch, principle of operation, multiple clutch construction, working, servicing and maintenance.	Explaining where it is used and finding faults in its operation. Dismantling the clutch, checking for wear and tear, cleaning injecting and reassembling with new clutches.
7	Gear box, types of gears, types of gear boxes i.e., sliding mesh gear box and constant mesh gear box. Necessity of gear box and lubrication of gear box.	To study about gear box. Dismantling the gear box. cleaning, inspecting and reassembling .
8	Functions of shock absorbers and telescope shock absorbers. Transmission of power-chain drive, belt drive and their functions.	Fault finding and rectifying suspension springs. Dismantling of shock absorber, inspecting replacing with new springs, oil seals and oils.
9	Braking principles, Mechanical and hydraulic brakes and brakes. Requirements of good braking system and maintenance of brakes.	Dismantling of both front and rear brakes, Cleaning ,inspecting and refitting.
10	Three wheeler service station layouts, factors effecting service station. Three wheeler maintenance – servicing and maintenance of two stroke and four stroke engines.	To study about the service station setup. To study about 3 wheeler maintenance.
11	Tool kit of mechanics, service station tools and special tools.	What are the tools used where they are used are studied in detail.
12	Raw materials, consumables,	To study about raw materials.

kerosene, Cotton waste, grease, engine oil.	
Revision and Tests	Revise Practical.

MODULE: III: FOUR WHEELER MECHANISM

WEEK. NO	THEORY	ON THE JOB TRAINING
1	Construction and working of spark ignition, and C.I., 4-stroke engine. Comparison of four stroke spark ignition engine and C.I.engine.	Study the working of four stroke spark ignition and C.I.engine with the help of a sectional model. Dismantling the four stroke engine, cleaning and inspecting the parts and also reassembling the (working model) engine.
2	Construction and working of four stroke spark ignition and C.I. engine parts i.e., Cylinders head, Cylinder, Piston, Connecting rod, Crank Shaft, Dry sump, Wet sump, Spark Plug, Carburetor.	Cleaning the spark plug, injector and injection pump, setting the spark plug gap or replacing the spark plug with new one. Dismantling the carburetor cleaning and inspecting the parts and also reassembling the parts. Fixing the carburetor on engine.
3	Construction and working of Air cleaners, Silencers, Mufflers (four Wheelers only). Necessity of cooling system, Study air cooling system, advantages and disadvantages of air cooling system.	Dismantling the air cleaner, cleaning, inspecting, setting and refitting to the vehicle. Dismantling the manifolds and muffler. Cleaning, inspecting, setting and refitting to the vehicle.
4	Necessity of lubricating system, Study the splash type and pressure lubrication system. Types of oils which are used in two wheeler engines.	Fault finding and rectification in lubrication system. Inspecting the lubricating system, changing of oil filters.
5	Necessity of Ignition system, construction and working of battery ignition system. Detailed study of four wheeler automobile wiring circuits. Starting motor- motor working principle construction and function of the battery.	Cleaning and testing of ignition system. Removing the contact breaker points, setting the ignition timing and C.B. point gap or replacing with new contact breaker points. Removing the battery, Checking the electrolyte, Specific gravity and reconnecting. Fault finding and rectification of magneto ignition system. Fault finding and rectification of ignition and Lighting circuit. Fault finding and rectification in starting motor.
6	Function of clutch, principle of operation, single plate clutches construction, working, servicing and maintenance.	Explaining where it is used and finding faults in its operation. Dismantling the clutch, checking for wear and tear, cleaning injecting and reassembling with new clutches.

7	Gear box, types of gears, types of gear boxes i.e., sliding mesh gear box and constant mesh gear box and synchromesh gear box. Necessity of gear box and lubrication of gear box.	To study about gear box. Dismantling the gear box. Cleaning , inspecting and reassembling .
8	Functions of shock absorbers and telescope shock absorbers and leaf springs. Transmission of power and their functions.	Fault finding and rectifying suspension springs. Dismantling of shock absorber, inspecting replacing with new springs, oil seals and oils.
9	Braking principles, Mechanical and hydraulic brakes and brakes. Requirements of good braking system and maintenance of brakes.	Dismantling of both front and rear brakes, Cleaning, inspecting and refitting.
10	Four wheeler service station layouts, factors effecting service station. Four wheeler maintenance – servicing and maintenance of four stroke engines.	To study about the service station setup. To study about wheeler maintenance.
11	Tool kit of mechanics, service station tools and special tools.	What are the tools used where they are used are studied in detail.
12	Raw materials, consumables, kerosene, Cotton waste, grease, engine oil. Revision and Tests	To study about raw materials. Revise Practical.

7. LIST OF TOOLS & EQUIPMENT

1. Air Compressor
2. Tyre Inflator
3. Work Bench
4. Oil Spray Gun
5. Hydro Meter
6. Battery Charger
7. Tool kit

8. QUALIFICATION FOR TEACHING FACULTY

1. Diploma Automobile Engineering with 3 years experience
2. Diploma in mechanical Engineering with 5 years experience
3. Mechanic with 6 years experience

9. REFERENCE BOOKS

1. The Automobile by Harbans Singh Reyat
2. Automobile Engineering by R.B.Gupta.
3. Automotive mechanics by S.Srinivas
4. Automotive Mechanics Trade manual by K.C.Kohad

10. LIST OF PARTICIPANTS

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