SCHEME OF EXAMINATION

And

SYLLABUS

For

Bachelors in Vocation (B. Voc.)

1 Year Program

in

AUTOMOBILE SERVICING

(under RPL)

Offered by

Community College of Skill Development

J C Bose University of Science & Technology YMCA
Sector-6, Mathura Road, Faridabad,

Haryana, India

2023-24

ABOUT THE COMMUNITY COLLEGE OF SKILL DEVELOPMENT

The Community College model is a flexible, open education system that is based on lifelong learning needs and is accessible to a large number of individuals in the community. Community College of Skill Development was started in 2013. It primarily focuses on imparting skill-based education on the models of National Occupational Standards (NOS). It provides Entrepreneurship Orientation to the students. Community College of Skill Development has been running B.Voc. in Automobiles since 2018 with a mission to impart quality education along with extensive hands-on training on the equipment/systems in automobile laboratories and industries. The presence of highly skilled and qualified trainers helps the students to enhance their professional and skill levels.

ABOUT THE PROGRAM

The B. Voc. Degree 1 year program in Automobile servicing (under RPL) runs with a mission to impart knowledge, technical skills & hands-on training in automobiles servicing, focusing on four wheelers & two wheelers, both petrol & diesel, and Electrical Vehicles. This program is an outcome of recent industrial demand. This B.Voc program in Automobile servicing has emphasis on practical hands-on learning with adequate theoretical knowledge which makes students more employable and outshine in this field. This program is designed to introduce the person who has previous experience in the relative industry. The motive behind this course is to give them a comprehensive understanding from basic to advanced, of various automotive systems like transmission, brakes, steering, suspension, electrical & electronics, and engine performance, etc. Students under this program will acquire the necessary skills to diagnose and repair mechanical and computer controlled electronic systems on the latest models of automobiles. Vocational training programs have been created with the aim of imparting industry-specific skills in students. These programs are crafted in such a way that the students acquire skills, which will lead them to employment in the respective sector.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEO-1: To train students with practical skills and experimental practices related to core and applied areas of Automobile Engineering to expand their knowledge horizon beyond books and make them industry ready.

PEO-2: To enable students to service, design and maintain automotive equipment which are useful for the industries.

PEO-3: To improve team building, team working and leadership skills of the students with high regard for ethical values and social responsibilities.

PEO- 4: To enable students to communicate effectively and efficiently.

PROGRAMME OUTCOMES (POs)

After completion of the program, the student will:

1. Be trained to NSQF level 5.5 in at least one job/profile in the field of automotive skills.
2. Be trained for multiple skill sets under the domain of automotive skills like Body repair, refinish painting technology, wheel care, engine emission system, automotive electrical circuit designing, vehicle dynamics etc.
3. Be able to supervise the various automotive workshop floors for mechanical shop, wheel care, body & paint repair.
4. Be trained & equipped with knowledge and understanding to start his/her own enterprise in automotive sales and services.
5. Able to develop skills in management of customer issues, analysis and evaluation of mechanical, electrical and electronics faults.
6. Plan and set up his/her enterprise/agency for repair and overhaul of engines and power trains, repair of suspension and steering system, wheel maintenance or spare parts business of any automotive OEM.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

To apply practical skills, vocational training and knowledge of automobile servicing fundamentals to industries. The student will be ready and skilled to take-up a career or to pursue higher studies with high regard to ethical values and social responsibilities.

SCHEME OF EXAMINATION

FIRST SEMESTER

Subject Code	Subject Name	L-T-P	Credit	Marks Weightage		Course Type
				Internal	External	
AES-11	Business Communication	3-0-0	3	25	75	SDP
AES-12	Basics of Automobile Technology	3-0-0	3	25	75	PCC
AES-13	Internal Combustion Engine	3-0-0	3	25	75	PCC
AES-14	Automobile Electrical & Electronics	3-0-0	3	25	75	PCC
AES-15	On Job Training (OJT)/ Internship	0-0-16	8	30	70	OJT
Total		**12-0-16**	**20**	**130**	**370**	

SECOND SEMESTER

Subject Code	Subject Name	L-T-P	Credits	Marks Weightage		Course Type
				Internal	External	
AES-21	Employability Skill	3-0-0	3	25	75	SDP
AES-22	Motor Vehicle Technology	3-0-0	3	25	75	PCC
AES-23	Electrical and Hybrid Vehicles	3-0-0	3	25	75	PCC
AES-24	Automobile Servicing	3-0-0	3	25	75	PCC
AES-25	On Job Training (OJT)/ Internship	—	8	30	70	OJT
Total		**12-0-16**	**20**	**130**	**370**	

SCHEME OF EXAMINATION

FIRST SEMESTER

Subject Code	Subject Name	L-T-P	Credit	Marks Weightage		Course Type
				Internal	External	
AES-11	Business Communication	3-0-0	3	25	75	SDP
AES-12	Basics of Automobile Technology	3-0-0	3	25	75	PCC
AES-13	Internal Combustion Engine	3-0-0	3	25	75	PCC
AES-14	Automobile Electrical Equipment	3-0-0	3	25	75	PCC
AES-15	On Job Training (OJT)/ Internship	—	8	40	60	OJT
Total		**12-0-0**	**20**	**140**	**360**	

AES-11: Business Communication
B. Voc. (Automobile Servicing) I Semester

No. of Credits:			3	Sessional:	25 Marks
L	T	P	Total	Theory:	75 Marks
3	0	0	3	Total:	100 Marks
				Duration of Exam:	3 Hours

Pre- Requisite: Communication Skills.

Course Objectives: The objective of studying this course is to discuss Business Communication skills and their forms and how it is going to help the students. To acquire the practical knowledge of business communication skills,writing skills, along with group discussion and interview skills.

Course Outcomes: At the end of the course, the student shall be able to:

CO1 To discuss types of business communication and their forms

CO2 To improve group communication

CO3 To improve spoken English and ability to articulate ideas

CO4 To improve formal writing skills.

Course Contents:

UNIT-I INTRODUCTION: Definition and classification of communication, purpose of communication, process of communication, importance of communication in management, communication structure in organization, barriers and gateway in communication, 7 C's of communication, Impact of cross cultural communication.

UNIT-II EMPLOYMENT COMMUNICATION: Writing CVs and Application Letter, Group discussions, interview, types of interview, candidates preparation, Interviewers preparation; Impact of Technological Advancement on Business Communication; Communication networks, Intranet, Internet, teleconferencing, video conferencing ORAL COMMUNICATION: What is oral Communication, principles of successful oral communication, two sides of effective oral communication, effective listening, non–verbal communication, Body language, Paralanguage.

UNIT-III WRITTEN COMMUNICATION: Purpose of writing, pros and cons of written communication, clarity in writing, principles of effective writing, writing technique. BUSINESS LETTERS AND REPORTS: Introduction to business letters, Types of business letter, Layout of business letter, Reports: definition and purpose, types of business reports, reports writing.

UNIT-IV GROUP COMMUNICATION- Meetings: need, importance and planning of Meetings, drafting of notice, agenda, minutes and resolutions of Meeting, writing memorandum, press release, press conference, Business etiquettes – netiquettes, telephonic and table etiquettes. PRESENTATION SKILLS: What is a presentation: elements of presentation, designing a presentation, advanced visual support for business presentation, types of visual aid, appearance and posture, practicing delivery of presentation.

UNIT-V CORPORATE COMMUNICATION: Definition, scope, importance and components of corporate communication, professional communicator responsibilities, corporate communication and Public Relation, role of social media in communication.

Text Books:

1. M.K. Sehgal and V. Khetrapal - Business Communication (Excel Books).

2. UrmilaRai, Business Communication, Himalaya Publishing House

AES-12: BASICS OF AUTOMOBILE TECHNOLOGY

B. Voc. (Automobile Servicing) I Semester

No. of Credits:			3	Sessional:	25 Marks
L	T	P	Total	Theory:	75 Marks
3	0	0	3	Total:	100 Marks
				Duration of Exam:	3 Hours

Pre- Requisite: Nil

Course Objectives: The course should enable the students to know the basics of automobiles, to understand about the suspension and steering system and wheels and tyres.

Course Outcomes: At the end of the course, the student shall be able to:

CO1 To introduce automobile basics.

CO2 To understand the suspension and steering system

CO3 To study automobile wheels and tyres.

Course Contents:

UNIT 1: INTRODUCTION
Introduction to an Automobile, Brief history of an Automobile, Classification of Automobiles, Parts of an Automobile, Performance of an Automobile.

UNIT 2: CHASSIS AND SUSPENSION
Introduction to Chassis, Classification of Chassis, Frame, Vehicle Dimensions, Introduction to Suspension System Functions/Objects of a Suspension System, Requirements of a Suspension System, Elements of a Suspension System, Springs, Dampers (or Shock Absorbers), Suspension Systems, Wheels and Tires

UNIT 3: TRANSMISSION SYSTEM
Introduction to Transmission System, Clutch Gearbox (Transmission), Propeller Shaft Universal Joints, Final Drive and Differential, Rear Axles.

UNIT 4: STEERING AND FRONT AXLE
Purpose of a Steering System, Functions of a Steering System, Requirements of a Good Steering System, General arrangement of a Steering System, Steering Gears, Steering Ratio, Reversibility, Steering Geometry, Wheel Alignment ,Steering Mechanism, Understeering and Oversteering, Steering Linkages, Steering Wheel and Column, Steering Arm, Drag link, Steering Stops, Adjustment of Steering Geometry, Introduction to Front Axle, Construction of Front Axle, Types of Front Axles

UNIT 5: BRAKING SYSTEM
Introduction to Braking System, Necessity of a Braking System, Functions of Brakes, Requirements of a Good Braking System, Classification of Brakes, Mechanical Brakes, Hydraulic Brakes, Power Brakes, Brake Effectiveness, Anti locking Braking System.

Reference Books:

1. Automobile Engineering, R.K. Rajput, Laxmi Publications.
2. Automobile Mechanics, A.K. Babu, S.C. Sharma, T.R. Banga, Khanna Publishing House.
3. Automobile Engineering by Dr. Kripal Singh.

AES-13: INTERNAL COMBUSTION ENGINE

B. Voc. (Automobile Servicing) I Semester

No. of Credits:			3	Sessional:	25 Marks
L	T	P	Total	Theory:	75 Marks
3	0	0	3	Total:	100 Marks
				Duration of Exam:	3 Hours

Pre- Requisite: Nil

Successive: Applied Thermodynamics, Heat and Mass Transfer, IC Engines, Refrigeration and Air Conditioning

Course Objectives: This course is designed to help students to understand the concepts of internal combustion engines, its combustion and various performance parameters.

Course Outcomes: After completing this course, student will be able to:

CO1 To learn the concepts of IC Engine.

CO2 To understand the concept of combustion in SI and CI engines.

CO3 To acquire knowledge about two stroke engines.

CO4 To check the performance parameters of IC engines.

Course Contents:

UNIT 1: INTRODUCTION TO IC ENGINE
Classification of IC Engines, applications of IC Engines, engine cycle energy balance, basic idea of IC Engines, different parts and terms connected with IC Engines, working cycles, indicator diagram, 4 stroke cycle engine, 2 stroke cycle engine, comparison of 4 stroke and 2 stroke engine, comparison of SI and CI engine.

UNIT 2 COMBUSTION IN SI ENGINE
Introduction to combustion in SI Engine. Combustion Phenomenon, Effect of Engine Variables on Ignition Lag, Spark Advance and Factors Affecting Ignition Timing, Pre-ignition, Detonation, Performance Number, Highest Useful Compression Ratio (HUCR), Combustion Chamber Design-S.I. Engines, Some Types of Combustion Chambers.

UNIT 3 COMBUSTION IN CI ENGINE
Introduction to Combustion in C.I. Engines. Combustion Phenomenon in C.I. Engines Fundamentals of the Combustion Process in Diesel Engines. Delay Period (or Ignition Lag) in C.I. Engines. Diesel Knock. C.I. Engine Combustion Chambers. Cold Starting of C.I. Engines.

UNIT 4 TWO STROKE ENGINE
General Aspects, Intake for Two Stroke Cycle Engines, Scavenging Process, Scavenging Parameters, Scavenging Systems, Crankcase Scavenging, Scavenging Pumps and Blowers.

UNIT 5 TESTING AND PERFORMANCE OF IC ENGINE

Testing and Performance of I.C. Engines, Introduction to Testing and Performance of I.C. Engines Performance Parameters, Basic Measurements, Engine Performance Curves, Comparison of Petrol and Diesel Engines-Fuel Consumption, Load Outputs and Exhaust Composition, Governing of I.C. Engines, Noise Abatement

Reference Books:

1. Automobile Engineering, R.K. Rajput, Laxmi Publications.

2. Automobile Mechanics, A.K. Babu, S.C. Sharma, T.R. Banga, Khanna Publishing House

3. Automobile Engineering by Dr. Kripal Singh

AES-14: AUTOMOBILE ELECTRICAL & ELECTRONICS

B. Voc. (Automobile Servicing) I Semester

No.of Credits:			3	Sessional:	25 Marks
L	T	P	Total	Theory:	75 Marks
0	0	3	3	Total:	100 Marks
				Duration of Exam:	3 Hours

Pre- Requisite: Nil

Course Objectives: The course should enable the students to understand the basics of batteries, used for electrical components of automobiles, electrical components of automobiles, and the electrical wiring and lighting.

Course Outcomes: At the end of the course, the student shall be able to:

CO1 Students will be able to understand various Automobile Electrical Equipment.

CO2 Students will be able to understand ignition systems.

CO3 Students will learn about electronic ignition systems.

CO4 Students will understand about auto bile wiring, lighting and sensors.

Course Contents:

UNIT I: AUTOMOTIVE ELECTRICAL SYSTEM

Overview of automotive electrical systems, Basic electrical principles, Automotive wiring diagrams.

UNIT II: BATTERIES

Principle and construction of Lead Acid Battery, Nickel – Cadmium Battery, Nickel Metal, Hybrid Battery, Sodium Sulphur Battery and Aluminum Air Battery, Characteristics of Battery, Battery, Capacity and Efficiency, Various Tests on Battery, Battery–Charging Techniques, Maintenance of batteries.

UNIT III: ELECTRICAL COMPONENTS

Requirements of Starter Motor, Starter Motor types, construction and characteristics, Starter drive mechanisms, Starter Switches and Solenoids, Charging system components, Generators and Alternators, types, construction and Characteristics. Voltage and Current Regulation, cut –out relays and regulators, Charging circuits for D.C. Generator, A.C. Single Phase and Three – Phase Alternators.

UNIT IV: ELECTRICAL AND ELECTRONIC IGNITION SYSTEMS

Conventional ignition systems, Battery and Magneto, Electronically–Assisted and Full Electronic Ignition System, Non–Contact–type Ignition Triggering devices, Capacitive Discharge Ignition Distributor–less Ignition System, Digital Ignition System, Control Strategy of Electronic Ignition System.

UNIT V: SENSORS AND ACTUATORS

Types of automotive sensors (temperature, pressure, position, etc.), and their working, Actuators (relays, solenoids, motors) their construction and working, Role of sensors and actuators in vehicle control systems, Sensors like Speedometer, Odometer, Fuel Level Indicator Oil Pressure and Coolant Temperature Indicators, Automotive Wiring Circuits.

Text books

1. Young, A.P. and Griffith, S.L., Automobile Electrical Equipment, ELBS and New Press.
2. Kholi .P.L. Automotive Electrical Equipment, Tata McGraw-Hill co ltd, New Delhi, 2004
3. Automotive Electricals and Electronics, A.K

AES-15: On Job Training (OJT) Internship

B. Voc. (Automobile Servicing) I Semester

Subject Code	**Subject Name**	**Credits**	**Marks Weightage**		**Course Type**
			Internal	**External**	
AES-15	On Job Training (OJT)/ Internship evaluation including report and presentation	8	30	70	OJT
	Total	**8**	**30**	**70**	

Students will go into industries for **On Job Training**. Students will be evaluated based **upon On Job Training (OJT)/Internship** including report and presentation.

SECOND SEMESTER

Subject Code	Subject Name	L-T-P	Credits	Marks Weightage		Course Type
				Internal	External	
AES-21	Employability Skills	3-0-0	3	25	75	SEP
AES-22	Motor Vehicle Technology	3-0-0	3	25	75	PCC
AES-23	Electrical and Hybrid Vehicles	3-0-0	3	25	75	PCC
AES-24	Automobile Servicing	3-0-0	3	25	75	
AES-25	On Job Training (OJT)/ Internship	—	8	30	70	OJT
Total		**12-0-0**	**20**	**140**	**360**	

AES-21:EMPLOYABILITY SKILLS

B. Voc. (Automobile Servicing) II Semester

No. of Credits:			3	Sessional:	25 Marks
L	T	P	Total	Theory:	75 Marks
3	0	0	3	Total:	100 Marks
				Duration of Exam:	3 Hours

Pre- Requisite: Communication skills, soft skills.

Successive: Professional and personal development.

Course Objectives: The objective of studying this course is to encourage the all-round development of students by focusing on behavioral skills and to make the students aware of the importance, the role and the content of behavioral skills through instructions, knowledge acquisition, demonstration and practice.

Course Outcomes: At the end of the course, the student shall be able to:

CO1 Understand the importance of behavioral skills.
Prepare for an interview.
CO2 Effectively communicate through verbal and nonverbal communication.
CO3 Deals with various types of behaviors in effective manners.
CO4 To acquire knowledge on Voices and Sentence Making.

Course Contents:

Unit 1:EMPLOYABILITY SKILLS

Soft skills– Definition and Significance of Soft Skills; Process, Importance and Measurement of Soft Skill Development. Teamwork Skills, Leadership Skills, Interview –Types.

Unit 2: PERSONALITY DEVELOPMENT AND PRESENTATION SKILL

Types of Personality, Gesture, posture, facial expression, body Language, Personality development programs and techniques, Group Discussion, Presentations Types and making effective presentations.

Unit 3: COMMUNICATING WITH STAKEHOLDERS

Communication with customers, dealing with angry customers, call flow, Opening and closing a call, Communication with industry partners/suppliers/dealers/agents, Feedback: Giving and receiving a Feedback.

Unit4: WRITING SKILLS

letter Writing, business letter,application letter, covering letter, formal mail, report writing, academic report, business report, technical project report, job application and resume writing.

Text Books/ Reference Books:

1. Wren and Martin. High School English Grammar and Composition. New Delhi:RRP, 2007
2. Murphy, Raymond. Essential English Grammar. New Delhi: Cambridge, 2017.
3. Malhotra, Prerna and Halder, Deb. Communication Skills: Theory and Practice.

AES-22: MOTOR VEHICLE TECHNOLOGY

B. Voc. (Automobile Servicing) II Semester

No.of Credits:			3	Sessional:	25 Marks
L	T	P	Total	Theory:	75 Marks
0	0	3	3	Total:	100 Marks
				Duration of Exam:	3 Hours

Pre- Requisite: Nil

Course Objectives: The aim of studying this course is to introduce the automobile fuel supply system, to understand the suspension and steering system, and study about Automobile Pollution.

Course Outcomes: At the end of the course, the student shall be able to:

CO1 To learn various components of automobiles.

CO2 To improve understanding about the power unit of automobiles.

CO3 To acquire knowledge about steering and suspension systems.

CO4 To be able to check the wheel is unbalanced.

Course Contents:

UNIT 1: FUEL SUPPLY SYSTEM IN S.I ENGINE
Introduction to Carburetion and Carburetors, Induction System, Factors Influencing Carburetion, Mixture Requirements, Distribution, Transient Mixture Requirements, A Simple or Elementary Carburetor, Complete Carburetor, Carburetors, Petrol Injection, Theory of Simple Carburetor.

UNIT 2: FUEL SUPPLY SYSTEM IN C.I ENGINE
Introduction to Fuel Injection Systems for C.I. Engines, Functional Requirements of an Injection System, Functions of a Fuel Injection System, Fuel Injection Systems, Fuel Pump and Fuel Injector, Types of Nozzles and Fuel Spray Patterns, Engine Starting Systems, Fuel Injection Computation in C.I. Engines, troubleshooting of a Fuel System, Troubleshooting of Carburetor Comparative Diesel Engine Fuel, System Data Some Indian Automobiles.

UNIT 3: ENGINE FRICTION AND LUBRICATION SYSTEM
Total Engine Friction Effect of Engine Parameters on Engine Friction Determination of Engine Friction Lubrication Systems Crankcase Ventilation Lubrication System of Some Indian Vehicles.

UNIT 4: AIR POLLUTION FROM IC ENGINES
Emissions from SI and CI engines, Effects of Toxic Gas Components on Human Health, Generation of Toxic Exhaust Gas Components, Correlation Between Toxic Components of Exhaust.

UNIT 5: VEHICLE EMISSIONS CONTROL METHODS

Vehicle Emissions Control Methods, Evaporative Emission (EVAP) Control System, Positive Crankcase Ventilation (PCV) System (or Blow-by Gas Control), Controlling Combustion to Improve Emissions Treatment of Exhaust Gasses, Secondary Air Injection System, Three Way Catalytic Converter (TWC), Exhaust Gas Analyzer, Smoke Meter, Exhaust Emission, Standards for Pollution, Control Fuel Quality Standards, Fuel Additives.

Reference Books:

1. Automobile Engineering, R.K. Rajput, Laxmi Publications.
2. Automobile Mechanics, A.K. Babu, S.C. Sharma, T.R. Banga, Khanna Publishing House
3. Automobile Engineering by Dr. Kripal Singh

AES-23: ELECTRIC AND HYBRID VEHICLE

B. Voc. (Automobile Servicing) II Semester

L	T	P	Total		
				Theory:	75 Marks
0	0	3	3	Total:	100 Marks
				Duration of Exam:	3 Hours

Pre- Requisite: Nil

Course Objectives: The course should enable the students to understand general aspects of Electric and Hybrid Vehicles (EHV), including architectures, modeling, sizing, and sub system design and hybrid vehicle control, to Understand about vehicle dynamics, Design the required energy storage devices, and Understanding of hybrid electric vehicles.

Course Outcomes: At the end of the course, the student shall be able to:

CO1 Electric and hybrid vehicle operation and architectures.
CO2 Design of hybrid and electric vehicles.
CO3 Energy requirement for vehicles.
CO4 Vehicle characteristics, operating modes, and performance parameters of the vehicle
CO5 Different subsystems of hybrid and electric vehicles

Course Contents:

Unit 1: INTRODUCTION
Introduction to electric and hybrid electric vehicles, History of hybrid and electric vehicles, Social and environmental importance of electric and hybrid electric vehicles, Electrical basics, Motor and generator basics.

Unit 2: ELECTRIC AND HYBRID ELECTRIC DRIVE TRAINS
Types by drivetrain structure, Series hybrid, Parallel hybrid Combined hybrid; Types by degree of hybridization Strong, hybrid Medium hybrid, Mild hybrid / micro hybrid, Plug-in hybrid, Types by nature of the power source Electric-internal combustion engine, hybrid Fuel cell hybrid Human power and environmental power hybrids. Pneumatic hybrid Hydraulic hybrid.

Unit 3: POWER FLOW
Power flow control in electric and hybrid electric drive train topologies.

Unit 4: ELECTRIC DRIVE COMPONENTS
Introduction to electric drive components used in electric and hybrid vehicles, Electric motor requirements, Direct Current (DC) motors (Brushed and Brushless), Power converters, Drive controllers.

Unit 5: SUBSYSTEMS OF HYBRID AND ELECTRIC VEHICLES
Power Split devices for Hybrid Vehicles - Operation modes - Control Strategies for Hybrid Vehicle-Economy of hybrid Vehicles. Steering and Suspension system. Choice of Tires.

Text Books/ Reference Books:

1. Electric & Hybrid Vehicles, A.K. Babu, Khanna Publishing House
2. Automotive Fuel Technology-Electric, Hybrid and Fuel-Cell Vehicles: Jack Erjavec& Jeff Arias.
3. Electric and Hybrid Vehicles: Design Fundamentals: Iqbal Husain
4. Modern Electric, Hybrid Electric, and Fuel Cell Vehicles: Fundamentals, Theory and Design: Mehrdadehsani, Yimingao, AliEmadi.

AES-24: AUTOMOBILE SERVICING

B. Voc. (Automobile Servicing) II Semester

L	T	P	Total		
				Theory:	75 Marks
0	0	3	3	Total:	100 Marks
				Duration of Exam:	3 Hours

Pre- Requisite: Nil

Course Objectives: The course should enable the students to understand general aspects of automobile servicing.

Course Outcomes: At the end of the course, the student shall be able to:

CO1 To understand the engine tuning.
CO2 To understand about wheel balancing
CO3 To understand about workshop equipment used in automobile servicing
CO4 To understand the fuel supply system and its maintenance.

UNIT 1: ENGINE TUNING
Meaning and scope of engine tuning. Necessity of engine tuning, Spark. Engine analysis and tuning with the help of diagnostic computer, Diesel engine injection timing checking ,Engine tuning of conventional and MPFI petrol engines, Adjustments of spark plug gap, valve tappet clearance, head bolts, Use of vacuum and compression gauge, Air cleaner cleaning, Ignition timing setting by timing light, Pollution checking.

UNIT 2 WHEEL BALANCING
Reasons of wheel imbalance, Effect of wheel imbalance on stability of vehicle. Static and dynamic balancing, Wheel balancing by the application of weights, Wheel Alignment: Meaning of wheel alignment, Various angles-camber, caster, KPI & toe - and their effect on steering stability, General values of popular Indian vehicles, Wheel alignment on computerized wheel aligner

Unit 3: WORKSHOP EQUIPMENT
Equipment for testing electrical accessories: Electric test bench, growler, coil tester, ignition and cam-dwell-angle tester; wiring harness tester. Ampere-hour battery tester, voltmeter tester, Layout of diesel injector and F.I.P. reconditioning shop, Tools and equipment required.

Unit 4: FUEL SYSTEM
Maintenance Schedule of diesel engine fuel injector, hot plugs, rotary and reciprocating type of fuel injection pump, fuel injection pump of single cylinder engines, hoses & pipe lines, priming unit, tanks. Electricals: Maintenance Schedule of batteries, starter motor, dynamo, ignition system, wiper motor, electrical fuel pump, alternator, horn.

Reference Books:
1. Automobile Mechanics, A.K. Babu, S.C.Sharma, T.R. Banga, Khanna Publishing House

AES-25: On Job Training (OJT) Internship

B. Voc. (Automobile Servicing) II Semester

Subject Code	**Subject Name**	**Credits**	**Marks Weightage**		**Course Type**
			Internal	**External**	
AES-25	On Job Training (OJT)/ Internship evaluation including report and presentation	8	30	70	OJT
	Total	**8**	**30**	**70**	

Students will go into industries for **On Job Training**. Students will be evaluated based **upon On Job Training (OJT)/Internship** including report and presentation.

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