NOIDA INSTITUTE OF ENGG. & TECHNOLOGY, GREATER NOIDA, GAUTAM BUDDH NAGAR
(AN AUTONOMOUS INSTITUTE)

NIET
Greater Noida
Autonomous Institute
Estd.2001
Get Future Ready

Affiliated to

DR.A.P.J. ABDUL KALAMTECHNICAL UNIVERSITY UTTAR PRADESH, LUCKNOW

In association with

Mercedes-Benz

Mercedes Benz India Pvt. Ltd., Pune

Evaluation Scheme & Syllabus

For

Advance Diploma

in

Automotive Mechatronics

(Effective from the Session: 2024-25)

NOIDA INSTITUTE OF ENGG. & TECHNOLOGY, GREATER NOIDA, GAUTAM BUDDH NAGAR
(AN AUTONOMOUS INSTITUTE)

Advance Diploma in Automotive Mechatronics

EVALUATION SCHEME

Evaluation Scheme & Examination:

There is continuous assessment and evaluation by Trainer through assignment sheets / worksheets. The marking scheme as below:

Sr. No.	Module Name	Examination	Examination heads (Marks/duration in minutes)			Total Marks
			Theory	Practical	T/W	
1	Mechanical	Module 1	50	50	50	150
2	Electronics	Module 2	50	50	50	150
3	System Module	Three Modules together	100	200	100	400
4	Soft Skills		50	--	50	100
5	Workshop- I		---	--	100	100
6	Workshop – II				100	100
		Total	250	400	350	1000

1. Theory question papers shall comprise of either objective type or multiple-choice questions.
2. All theory exams and continuous evaluation sheets (Term work) will be evaluated by ADAM Trainers from Institute.
3. Final Practical Examination will be conducted by Mercedes- Benz Academy Assessor.
4. Final practical exam shall comprise of 50% marks (30 minutes) for work plan preparation and 50% marks (30 minutes) for job execution.
5. Passing marks against each examination head shall be 50%

Re- assessment

In most unlikely cases, if the student could not perform in the final practical assessment and failed to full-fill the requirements to be qualified in the practical exam, re- assessment will be conducted.

1. Each such case will be discussed with ADAM trainers. An Individual study plan is to be developed and executed by the student & trainers.
2. All re- assessments shall happen at the institute. Student has to be present for re-assessment in institute / suitable location as decided by Academy.
3. Student will get maximum of 2 chances for re- assessment. If Student fails to qualify even after 2 chances, he will continue to work as bench technician (if he is employed by Mercedes- Benz Dealer Network) and shall appear regular course for Certified Maintenance Technician.
4. Institute may charge additional fees for the re-examination.

Module 2: Electronics

1. Study of D.C. Technology	1. Understand concept of current & Voltage 2. Use of multi-meter as voltmeter, ampere meter and ohmmeter. 3. Assemble simple electrical circuit and measure the current at different points. 4. Verification of Ohm's law. 5. Verification of linearity of resister. 6. Plot VI Characteristics using NTC resister. 7. Plot VI characteristic using PTC resister 8. Observe the behavior of varistor. 9. Observe the behavior of I.DR. 10. Assemble a series circuit of resistors and measure current and voltage at different points. 11. Assemble a parallel circuit of resistors and measure current & voltage at different points. 12. Assemble a mixed series and parallel circuit of resistors and measure current and voltage at different points. 13. Measure the output voltage of unloaded voltage divider. 14. Measure the output voltage of unloaded voltage divider. 15. Measure the output voltage of a loaded voltage divider. 16. Measure the output voltage of a variable loaded voltage divider. 17. To plot the curve of an equivalent voltage source. 18. Series circuiting of voltage sources. 19. Parallel circuiting of voltage sources. 20. Determine the power converted into ohmic resistances. (Power loss)
2. AC current Technology	1. To observe different AC waveforms on CRO. 2. Measure frequency and calculate period and wavelength of AC waveform. 3. To plot charging and discharging curves of a capacitor. 4. To determine the phase difference between the current through the capacitor and voltage across the capacitor. 5. To determine capacitive reactance of a capacitor. 6. To measure current and voltage in a series circuit of capacitor. 7. To measure current and voltage in a parallel circuit of a capacitor. 8. To plot charging and discharging curves of inductor. 9. To determine the phase difference between the current through the inductor and voltage across the

	inductor. 10. To determine inductive reactance of inductor. 11. To measure current and voltage in a series circuit of inductor. 12. To measure current and voltage in a parallel circuit of an inductor. 13. Determine the transformation ratio on the primary and secondary side of a transformer with different number of windings.
3. Semi-conductor Components and devices.	1. To plot the VI characteristics of P-N junction diode 2. To observe the rectification effect of a diode with filter capacitor and without filter capacitor. 3. To plot the waveforms using bridge rectifiers. 4. To plot the characteristics of Zener diodes. 5. To observe Zener diode as a voltage regulator. 6. To record the characteristic of a LED. 7. To plot VI characteristics of a bi-polar junction transistor. 8. To observe transistor as a switch. 9. To plot output wave forms of an Astable multivibrator. 10. To plot output wave forms of a monostable multivibrator. 11. To plot output wave forms of a Bi-stable multi vibrator. 12. To observe transistor as an amplifier.
4. Digital Electronics	1. Construct AND, OR, NAND, NOT gates and verify the truth table. 2. Verify behavior of multiplexer. 3. Verify the behavior of A to D and D to A converters. 4. Verify the truth table of SR, JK, D and T flip-flops.
5. Wiring diagram	1. To know symbols of components connectors wires. 2. Interpret the wiring diagram 3. -To understand different electrical circuits.
6. CAN data bus	1. To understand how the control units are connected using different CAN bus systems.
7. Engine Electrics	1. To perform Alternator test 2. To perform Starter circuit test 3. To test battery
8. Engine Management systems for Gasoline engines	1. ME-SFI voltage supply function 2. ME-SFI fuel ignition and injection system function. 3. To measure the output voltage & to observe the output waveform of a crankshaft sensor. 4. To measure the output voltage & to observe the output waveform of a camshaft sensor. 5. ME-SFI engine speed signal function.

	6. Synchronizing fuel injection and firing order function. 7. ME-SFI fuel supply function. 8. ME-SFI fuel pump actuation function. 9. ME-SFI consumption signal function. 10. ME-SFI fuel reserve signal function. 11. ME-SFI cam shaft adjustment function. 12. ME-SFI electronic adjustment function. 13. ME-SFI idle speed control function. 14. ME-SFI throttle valve damping function. 15. ME-SFI O2 sensor control function. 16. ME-SFI oxygen sensor heating function. 17. ME-SFI catalytic converter efficiency monitoring function. 18. ME-SFI air injection function. 19. ME-SFI and knock control function. 20. ME-SFI engine oil information function. 21. ME-SFI starter control function. 22. ME-SFI starting function. 23. ME-SFI diagnostic fault memory function. 24. ME-SFI driving mode function. 25. ME-SFI idling function. 26. ME-SFI ignition ON function. 27. ME-SFI Limiting maximum speed function. 28. ME-SFI ignition system function. 29. ME-SFI start quantity control function. 30. ME-SFI acceleration enrichment function. 31. ME-SFI Part Load/Full operation. 32. ME-SFI Limiting Maximum Vehicle Speed function. 33. ME-SFI Fan control function. 34. ME-SFI Self adjustment function. 35. ME-SFI Correction programming function. 36. ME-SFI TWC heating function. 37. ME-SFI Smooth running analysis function. 38. ME-SFI Transmission shift point delay function. 39. ME-SFI Transmission over load protection function. 40. ME-SFI Overheating and pinging protection function. 41. ME-SFI intake air correction function. 42. ME-SFI input signals. 43. ME-SFI Output signals. 44. ME-SFI Function diagram.