



**Name of the Program(s): - Diploma in Electric and Hybrid Maintenance Engineering (DEHME),
Advanced Diploma in Electric & Hybrid Maintenance Engineering (ADEHME),
Certified Electric Vehicle Technician (CEVT),
Certified Hybrid Vehicle Technician (CHVT),
Certified Hybrid Electric Vehicle Technician (CHEVT).**

Are you interested in earning your Diploma in Electric and Hybrid Maintenance Engineering Professional degree? (DEHME or ADEHME or CEVT)™ certification, but you're unsure how to start the process? While this is a great step for your individual career, it doesn't have to be a complex one really if you study from GEPEA. This is the ultimate guide on CEVT™, CHVT™, CHEVT™ certification and it can be your easy roadmap for navigating this process. You may explore some common questions you might have about international Electric and Hybrid Technician certification holder.

What Does an Electric Vehicle Service and Repair Technician Do?

Electric car technicians service and repair electric and hybrid-electric cars, or vehicles that run on both gasoline and electricity. This job involves diagnosing, maintaining, and repairing these vehicles.

What Does a Hybrid Vehicle Technician Do?

Hybrid Vehicle Technicians inspect, maintain, and repair vehicles that run on both gas and electric power. Fixing problems with these systems requires the use of high-tech shop equipment, when working with electronic parts, as well as traditional tools.

Responsibilities specific to Hybrid Vehicle Technicians include:

Battery/electric systems replacement and repair, follow all hybrid vehicle and shop safety rules, perform in-depth mechanical and electrical repairs, Build High-Voltage and Low-Voltage electrical wiring, Build junction boxes, power distribution boxes and fuse boxes, communicate technical diagnoses and needed calibrations, continue to learn new technical information and techniques through online and/or instructor led training, Maintain necessary Hybrid/Electric Vehicle certifications.





ELECTRIC AND HYBRID VEHICLES TECHNICIAN PROFESSIONAL TRAININGS

Training Hours: 80 OR 100 hours.

Program Duration: 6 Months (Certifications). Electric and Hybrid Vehicles Technician Diploma program is a six months' course taught in distance learning /Online learning mode. *Diploma should be completed within 6 months (2 Semesters) and Advanced Diploma for two semesters through one or two additional subjects respectively.*

Admission Requirements: A high school diploma or an associate degree in general science or science (or global equivalent), Secondary degree (high school diploma, associate degree, or the global equivalent).

Other Requirements: Any Science related degree are needed to take this course, but have some extra skills using Electric Service and Maintenance tools will help.

Training Delivery: The course duration will comprise 80 or 100 hours of self-study home based or lecture based delivery. The 80 or 100 hours will be delivered in 9-10 sessions online distance learning based on given course materials.

Syllabus Outline

Serial No.	Syllabus component	Assignment TMA (Tutor Mark Assignment) or Case Study	Board Questions (OBS = Open Book System) Exam.	MCQ (Multiple Choice Questions) 10 Questions (each @ 2 marks)
	9 parts will count 7 hours each (9 parts/courses x 7 hours study each = 63 hours total) + Project Exercises Minimum 17 hours = Grand Total 80 Hours. Or for Advanced Diploma/Certified Electric & Hybrid Technician 10 parts will count 7 hours each (10 parts/courses x 7 hours study each = 70 hours + Additional Course 7 Hours = 77 Hours Total) + Project Exercises Minimum 23 hours = Grand Total 100 Hours.	45	35	20

1	Diploma in Electric and Hybrid Maintenance Engineering (DEHME), Advanced Diploma in Electric and Hybrid Maintenance Engineering (DEHME), Certified Electric Vehicle Technician (CEVT), Certified Hybrid Vehicle Technician (CHVT), Certified Hybrid Electric Vehicle Technician (CHEVT).	90 Hours (Time)		
	<p style="text-align: center;">SEMESTER -1</p> <p><u>1. Basics of Electricity and Vehicle Lighting:</u> Basics of Electricity Basics of Vehicle Wiring Vehicle Lighting Choosing Lighting Devices Making Connections</p> <p><u>2. Basics of Mechanical Engineering:</u> What Is Mechanical Engineering? “Engineering Scrutiny” Forces in Structures Stresses, Strains and Material Properties Fluid Mechanics Thermal and Energy Systems</p> <p><u>3. Small Gas Engines:</u> 1 Safety in The Small Gas Engine Shop 9 2 Engine Construction and Principles of 17 3 Two Cycle, Four Cycle, And Rotary Engines 33 4 Fuel Systems 53 5 Carburetion 63 6 Ignition Systems 85 7 Engine Lubrication 111 8 Engine Cooling 127 9 Measuring Engine Performance 137 10 Tools and Measuring Instruments 155 11 Troubleshooting, Service, And Maintenance 177 12 Fuel System Service 191 13 Ignition System Service 213 14 Cylinder Reconditioning 243 15 Pistons and Piston Rings 253 16 Rods, Bearings, And Valves 269 17 Small Gas Engine Applications 297</p> <p><u>4. Computerized Engine Controls:</u> Chapter 1: A Review of Electricity and Electronics Chapter 2: Computers in Cars Chapter 3: Common Components for Computerized Engine Control Systems Chapter 4: Common Operating Principles for Computerized Engine Control Systems Chapter 5: Diagnostic Concepts Chapter 6: Diagnostic Equipment</p>	45 7 Credit Hours Per Subject	35	20

Chapter 7: Exhaust Gas Analysis
 Chapter 8: Understanding OBD II
 Chapter 9: Multiplexing Concepts
 Chapter 10: General Motors' Electronic Engine Controls
 Chapter 11: Advanced General Motors Engine Controls
 Chapter 12: Ford's Electronic Engine Control IV
 Chapter 13: Ford's Electronic Engine Control V
 Chapter 14: Chrysler Corporation Fuel Injection Systems
 Chapter 15: European (Bosch) Engine Control Systems
 Chapter 16: Asian Computer Control Systems
 Chapter 17: Alternative Power Sources
 Chapter 18: Approach to Diagnostics

5. Electric and Hybrid Vehicles:

Electric Vehicles Introduction
 Safe working, tools & Hazard Management
 Electrical and Electronic Principles
 Electric Vehicle Technology
 Batteries
 Motors & Control Systems
 Charging
 Maintenance, Repairs and Replacement

SEMESTER -2

6. Automotive Electrical and Engine Performance: / Engine Performance Diagnostics:

Universal Testing Methods Section 1 1- 29
 Switch Inputs Section 2 1 -30 Transistor Drivers and Output
 Solenoids Section 3 1 - 30 Oxygen Sensor Introduction Section
 4 1 - 21 Oxygen Sensor Testing Section 5 1-27 Thermistors,
 Section 6 1-17 Potentiometers Section 7 1 - 15 Pressure
 Sensors Section 8 1 - 10 The 5 Volt Reference Circuit, Section 9
 1 - 6 Signal Circuit Integrity Testing Section 10 1-7 Substituted
 Values Section 11 1-6 Airflow Sensors, Section 12 1- 17 Types
 of Fuel Injection, Section 13 1 -8 Fuel Delivery Designs , Section
 14 1 -9 Fuel Pump Electrical Circuits, Section 15 1 - 19 Fuel
 Pressure Testing, Section 16 1- 16 Fuel Injector Driver Designs,
 Section 17 1 -7 Fuel Injector Testing, Section 18 1 - 26 No
 Injector Pulse, No Start Problems, Section 19 1 -5 Idle Speed
 Controls, Section 20 1- 29 Ignition System inputs, Section 21 1-
 33 No Start, No Spark problems, Section 22 1- 26 No Start,
 Good Spark and Injector Pulse Condition, Section 23 1 -2 EGR
 System Problems, Section 24 1 -8 Common Terns and
 Abbreviations, Section 25 1-2

7. Modern Electric, Hybrid Electric, and Fuel Cell Vehicles:

Fundamentals of Vehicle Propulsion and Braking
 Internal Combustion Engines
 Vehicle Transmission
 Electric Vehicles

*7 Credit
 Hours Per
 Subject*

	<p>Hybrid Electric Vehicles Electric Propulsion Systems Design Principle of Series (Electrical Coupling) Hybrid Electric Drivetrain Design & Control Methodology of series parallel Design & Control Principles of Plug in hybrid electric vehicles Peaking power sources & energy storage Fuel Cell Hybrid Electric Powertrain optimization</p> <p><u>8. Hybrid Vehicle General Servicing Issues:</u></p> <p>General Hybrid Safety Issues Undercar Service Lifting Oil Change & Filter Toyota Highlander 3.3 L. Servicing Engine Oil Specification Chart Escape eCVT Service Toyota Hybrid Transaxle Service Honda Civic CVT Service CVT Fluids Specification Chart 4x4 Rear Differential Fuel Filter Underhood Service Escape Air Filter Escape Dual Coolant Reservoirs Highlander Coolant Reservoirs Brake Fluid Escape Master Cylinder Escape Battery (A/C) Cooling System Battery (A/C) Cooling Filter HV Traction Battery Cooling Cooling System Service Escape ICE Cooling System Service Escape ICE: Steps for Re-Filling Escape Engine Running Diagnostic Mode HV Cooling System Overview Escape Transaxle Cooling System Service Prius Gen I ICE Cooling Systems Service Prius Gen I Inspection Mode Prius Gen II Coolant Pre-Heat Tank Prius Gen I Transaxle/Inverter Coolant Prius Gen II Transaxle Coolant Service Highlander ICE Cooling System Honda Civic ICE Cooling System Service Hybrid Auxiliary 12V Battery Hybrid Foundation Brakes</p> <p><u>9. Electric Motor Maintenance & Troubleshooting:</u></p> <p>AC Electric Motor Theory Troubleshooting and Testing the DC Machine The Single-Phase Moto The Three-Phase Induction Motor</p>	<p><i>7 Credit Hours Per Subject</i></p>		
		<p><i>7 Credit Hours Per Subject</i></p>		

	<p>Troubleshooting Three-Phase Motors Troubleshooting Less Common Motors Test Instruments and Services etc.</p> <p><u>OPTIONAL/ADDITIONAL SUBJECTS (For Advanced Diploma Any one/Two subjects can be chosen):</u></p> <p>### Basic Mechanical Engineering ### Hybrid Electric Vehicles: Principles & Applications with practical perspectives ### Hybrid Vehicles and Hybrid Electric Vehicles New Developments, Energy Management and Emerging Technologies ### Today's Technician: Automotive Electricity and Electronics ### Electric powertrain energy systems, power electronics & drives for hybrid, electric & fuel cell vehicles</p> <p>FOLLOWING ADDITIONAL TASKS SHOULD HAVE TO DONE BY PARTICIPANTS OR STUDENTS:</p> <ol style="list-style-type: none"> Electric and Hybrid Maintenance and Service Engineering Certification Test MCQ Questions answer practicing Electric and Hybrid Maintenance and Service Engineering Certification Test Board Questions/TMA (Tutor Mark Assignment) Electric and Hybrid Maintenance and Service Engineering Certification Case Studies <p>Exercises and projects</p> <p>Videos on Electric and Hybrid Vehicles Maintenance and Servicing technicians:</p> <ol style="list-style-type: none"> Routine Electric Vehicle Maintenance https://www.youtube.com/watch?v=LoFhI5wZRyY What does an EV Service look like? https://www.youtube.com/watch?v=FeK_ZpkIxn8 Hybrid/electric battery training https://www.youtube.com/watch?v=mIDh3yjWKcg https://www.youtube.com/watch?v=iXLRwwySAIs (Battery Voltage) What is Toyota Hybrid System https://www.youtube.com/watch?v=XFVd_fCiO88 Hybrid & Electric Vehicles - Safely Disconnect & Shutdown https://www.youtube.com/watch?v=SmLCIwzrjNc How a Hybrid Car Works, Hybrid Engines Explained https://www.youtube.com/watch?v=T9Dk_2_XL7k How Does a Hybrid A/C Compressor Work? https://www.youtube.com/watch?v=vx7JfXmMBvk Enable Maintenance Mode on your Toyota Hybrid https://www.youtube.com/watch?v=YAIH1_dysic Toyota hybrid battery full servicing https://www.youtube.com/watch?v=MMjrDctup5o Top 5: Electric Car Maintenance Schedule & Checklist https://www.youtube.com/watch?v=XLBr5gq4jME 	<p><i>7 Credit Hours Per Subject</i></p>		
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	Project/Thesis/Case Studies			
	<p>Student have to take a Project/Thesis/Case studies as per their major subject in order to complete his/her Diploma/Advanced Diploma.</p> <ul style="list-style-type: none"> • In case Project/Thesis, respective students should submit 25 to 45 (A4 Size) pages long report. <i>Course Tutor or Concern Authority will assign/fix Project/Thesis Topic or Title with consultation with respective student.</i> • In Case Studies, respective students should submit case studies answer script in written form to the GEPEA within stipulated time frame. <i>Concern Authority will assign case studies question paper in time.</i> 			
	<p>TOTAL HOURS REQUIRED TO BE COMPLETED FOR THE SOLAR ENERGY, ALTERNATIVE ENERGY, RENEWABLE ENERGY & ENGINEERING DIPLOMA OR PROFESSIONAL CERTIFICATIONS = 9 parts will count 7 hours each (9 parts/courses x 7 hours study each = 63 hours total) + Project Exercises Minimum 17 hours = Grand Total 80 Hours. Or for Advanced Diploma/Certified Electric & Hybrid Technician 10 parts will count 7 hours each (10 parts/courses x 7 hours study each = 70 hours + Additional Course 7 Hours = 77 Hours Total) + Project Exercises Minimum 23 hours = Grand Total 100 Hours.</p>			

What Do Electric and Hybrid Technician Do?

A certified or Diploma holder in Electric & Hybrid Technician will learn about electric and hybrid system components and operation, how to work safely on hybrid, electric and related vehicle systems and how to work safely around electric vehicles.

- ✓ State safety precautions to be taken before carrying out routine maintenance
- ✓ State safety precautions to be taken before carrying out any repair procedures on hybrid Vehicles
- ✓ Identify additional tools and equipment required to carry out work on hybrid vehicles
- ✓ Identify high voltage cabling and associated components
- ✓ Identify the components that make up the hybrid system
- ✓ Describe the construction and function of battery modules
- ✓ Describe the construction and function of hybrid motors
- ✓ Describe the construction and function of associated hybrid components
- ✓ Describe the precautions required when working with hybrid components
- ✓ Identify the possibility of the hybrid system affecting repairs on other vehicle systems
- ✓ Describe the procedures required to make safe the hybrid system before carrying out repair activities
- ✓ Describe the precautions taken prior to removing and replacing high voltage components
- ✓ Describe appropriate methods to re-instate vehicles after repairs affecting hybrid systems
- ✓ Describe how to connect an additional volt power source to a hybrid vehicle

COURSE MATERIAL

Besides using the traditional books GEPEA has also modernized the learning process by providing students with online portal consisting of –

- **Study Materials (Soft copies)** – PDF of books are provided to students making studies nomadic & convenient. GEPEA Department of Students Affairs will assign Study Materials via Email or other methods after registration and admission.
- The focal point of **GEPEA** study materials is enhancing Practical Education. **GEPEA** Kit provided to applicants is a world full of practical scenarios, explanation in terms of facts rather than theoretical phrases. Customized to be self-explanatory & easy to understand.
- **Faculty Guidance** – GEPEA panel of intellectuals guide students personally with regards to any query through email about any concept in the notes provided, being the author of the same.

EXAMINATION

GEPEA Professionals are given the privilege to answer exams from any examination center in the world along with the freedom to pick the exam schedule for the same, as time permits in the particular examination months of GEPEA. Students are allotted 2 modes of examinations – Home Based/Center Based.

- Question papers would be drafted by **GEPEA** panel of veteran professors which would be TMA (Tutor Mark Assignment), OBS (Open Book System) and MCQ study pattern. A single course will consist 100 marks based on these three pattern of exam types. In each program will consist a major (Thesis Research) course or theory in order to complete the respective Diploma Program.
- This unique & novel methodology teaches a student how to assess business situations and make decisions based upon those assessments, allowing students to display their potential.
- In case of home based/distance learning exams question paper would be emailed to the students, which they would have to answer & courier back to GEPEA office or GEPEA directed authority in the respectable exam slab.
- Candidate also has the option of appearing for Center Based Examination wherein they would have to visit one of the many GEPEA exam centers & complete answering the exam in the duration of 3 hours which wouldn't be an open book examination.

CASE STUDY METHOD & STUDY MATERIAL:

Today communication systems have advanced so much that it is much easier, convenient and quicker to gain expertise via online distance learning. GEPEA offer potential students the opportunity to study through an autonomous online distance learning program. This means that people who can't get traditional further education can still achieve what they want and get their qualifications through Online Distance Learning. That gives the opportunity for a much wider range of people to get the qualifications that they want. Today, thanks to technological advances, higher education is more readily available to those who want it.

GEPEA is an institute of excellence offering widest range of autonomous programmes in the field of Business Management and different Professional Training education. In response to the rapidly changing economic environment and the process of globalization, the Academy has made sustained efforts to bring an international perspective to all its wide range of areas and activities.

BENEFITS AND FETURES:

- (i) **Flexible Programs & Curriculum:** You can earn and study at the same time! From GEPEA International Curriculum, Flexibility is the biggest advantage of distance learning courses. This stands true especially if you are a working professional. Not everyone has the luxury of taking their own time to finish their studies. For those who had to take a break from studies to start working, such courses are a boon and provide the opportunity to pursue higher education.
- (ii) **Saves Time & Energy:** You save up a lot of time and energy on commuting. You can stay at any place and pursue a course that is available at GEPEA. Or you might be based out of a remote village or town which does not have enough options for higher studies. Distance learning courses eliminate these obstacles.
- (iii) **MCQ, Case Based Learning:** MCQ, A Case-based approach engages students in discussion of specific situations, typically real-world examples of African, Asian and International companies. Allowing the students to put their theoretical knowledge to practice.
- (iv) **Study at your own Pace:** Not everyone has the same pace of learning. Some students pick up things fast, others need time to grasp a concept. One of the biggest advantages of distance learning is that you can study at a pace that is comfortable for you.
- (v) **Saves Money:** These courses are almost always cheaper as compared to their on-campus counter-parts. You also cut down on the costs incurred while commuting etc.
- (vi) **Personal Fulfillment:** An MBA is the key to unlocking both a professionally and personally rewarding future. Education is the foundation upon which you can build lifelong business and personal achievements. The GEPEA MBA program is designed to enrich your personal life, as well as to keep you informed about a constantly changing industry.
- (vii) **Convenient:** You can submit your assignment with the click of a button or simply drop it off at a post-office! It's sometimes as simple as that!
- (viii) **24X7 Access to Study Material & fellow Students:** This is the best way to study if you are comfortable with internet and technology. You can access your study material online whenever you want and also clear doubts, exchange views and discuss with your virtual class-mates!
- (ix) **Study any Topic You Want:** Since you'd already have all your books/online study material with you, you can pick up any topic/chapter that interests you and tackle that first! This way your interest in the subject is sustained.
- (x) **Higher Level of Self-Confidence:** The knowledge gained through our Correspondence MBA program will enhance your effectiveness in your current position and help define your future career path. It will sharpen your skills in critical business areas, giving you the self-confidence you need to become a leader in your profession.
- (xi) **Specialization:** We provide more than 80 specializations which allow students to gain additional knowledge and background on specific business topics.

ACCREDITATIONS AND RECOGNITIONS:

ITQSM Accredited & International Partnered Professional Academies.

GEPEA has proudly claimed the Excellence in Online Distance Learning Award presented by its Governing Body Really Matters as a token of appreciation for providing top notch education to professionals globally. This solely proclaims that GEPEA is one of the best Professional Academy in the field of online distance learning.

PROFESSIONAL FACULTIES:

GEPEA Faculty members are highly professional, qualified & experienced. Professors provide substantial assistance through 24*7 web support. Each & every query regarding studies, assignments, cases, projects, research are resolved on time & responded with clear, relevant answers on par with syllabus. They update themselves from time to time about the changing market scenario & syllabus. Thus working professionals have chance to get resourceful information by interacting with professors through web-support from time to time. Timely communication & assistance is key to our successful association with our students & our professors believe in same.

GEPEA (Global Educational & Professional Excellence Academy)

*In case any query, please feel free to contact us via E-Mail:
gepea.official@gmail.com , office@gepea.eu or visit Website: www.gepea.eu or
www.gepea.education*