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Govt. of Maharashtra
GOVT. COLLEGE OF ENGINEERING, KARAD
(An Autonomous Institute of Govt. of Maharashtra)
Vidyanagar, Karad -415124 Dist.- Satara



Ref. No. 1213

E-TENDER Ref. No. : GCEK-2024-INST-EV
E-Tender form Fee Rs. 3000/-
E.M.D. – Rs. 50000/-

Digitally sealed tenders (Two-Bid System) as per e-tendering system are invited by office of The Principal, Govt. College of Engineering, Karad for the supply of following.

70 JUN 2024

Please refer to Instructions for Bidders. These are available on e-tendering web portal
<https://mahatenders.gov.in>

NOTICE DETAILS :

Tender Reference No.	GCEK-2024-INST-EV
Name of Work / Item / Service	<i>Purchase of Training Module of COE for EV with Training Material</i>
Tender Fee & Mode of Payment	Rs.3000/- (Rupees Three Thousand only) (Non Refundable) to be paid through Online Payment Modes during Tender Document Download Stage
E.M.D. Amount & Mode of Payment	Rs.50000/- (Rupees Fifty Thousand only) to be paid through Online Payment during Bid Preparation Stage
Venue of online opening of tender	Govt. College of Engineering, Karad
Address for Communication	The Principal, Govt. College of Engineering, Karad Vidyanagar, Karad-415124, Dist-Satara
Contact Telephone & Fax Numbers	Phone – (02164) 272414

(Dr. V.N.Kulkarni)
Principal
Govt. College of Engineering, Karad

Purpose – Create Technology infrastructure for new technology skilling of students under National education policy

Execution Roadmap

This is only an approximation. The detailed commitment of timelines should come as and when the module scope is defined with the discussions with the client team members.

- 1) Govt. College of Engineering, Karad will select Industry partners for different technology skilling like Electrical Vehicle with commitment of 100 students training.
- 2) Industry will set up a training lab including training material like hardware and open source free student version software licenses for no extra cost. This Lab will be owned by Institute after completion of 100 students training in three years.
- 3) Industry should provide details of the training curriculum and practical to be conducted on Tech lab provided by Industry as per units and phases suggested by the Institute in-line with guidelines of NEP 2020 as per annexure-I.
- 4) Institute Expert team will validate and align the Training course curriculum alignment with National Education Policy 2020.
- 5) Training will be imparted jointly by Selected Industry and Institute (Industry expert should take mix of offline ,online or remote training + Train Institute staff /Faculty also for the specified course).
- 6) Training course delivery and completion should be tracked on LMS of Institute or Company.
- 7) After completion Students should be able to appear for respective technology globally recognized certification exam.
- 8) Trained students should be connected to relevant industry to get jobs or internship in same technology field with possible help from the concerned industry.
- 9) Prototype project to be undertaken on Electric Vehicle Technical lab – Low cost Retrofit Electric Vehicle kit for two wheeler for rural area use.

Eligibility Criteria for the Bidder Entity (Pre-Qualification)

Sr No	Basic Requirement	Documents to be submitted
1	Legal Entity The bidder company/entity should be a company/entity registered under The Companies Act 1956/2013; or a registered partnership firm under The Partnership Act 1932/LLP Act, 2008 or a Society registered under the Societies Registration Act 1860.	1. Copy of Certificate of Incorporation issued by the Registrar of Companies, India / Certificate of commencement of business. or 1. Certificate of registration and partnership deed for LLP and partnership firm. and

2	The bidder entity should have been in existence for a period of at least 10 years on the bid due date (or any extended bid due date).	2. List of partners, directors, and principal place of registration, as applicable. 3. Relevant documents in support of the requisite experience.
3	Debarment The bidder should not have been blacklisted/ debarred by ERNET INDIA or any State or Central Government or autonomous body, State government undertakings, Central Public Sector Units (CPSUs)/ any other government organization or its undertakings in India at the time of bidding.	Self-declaration duly signed by the authorized signatory.
4	IPR Bidder should have the IPR rights of the content & Projects being supplied/delivered under this project.	Undertaking for this to be submitted by the bidder.
5	Product Support The products being quoted by the bidder should not have been declared as at “end- of-sale” and “end-of-support”. The bidder should also submit valid letter confirming following: <ul style="list-style-type: none"> • Undertake that the updates required in content/syllabus/subjects or any other change w.r.t supplied content if any w.r.t National Education Policy 2020 issued in July 2020 shall be taken care free of cost. An undertaking for same to be submitted by bidder. 	Undertaking for each of this needs to be submitted by the bidder.
6	Experience Requirement i. Domain Experience : Bidder should have the domain experience in Education Technology of successfully trained more than two thousand learners in higher education space within the last 3 years. ii. Bidder should have the experience of successfully executing a fully functional Center of Excellence in same domain as quoted or any other Latest/Emerging Technologies.	The bidder must submit the relevant documentation to substantiate the required work experience. The documentation shall include one of the following : Report including Photos, Work Orders and any other relevant document to prove successful work execution during last three years.

7	Demonstration : The bidder may be asked to present / demonstrate the offered product(s) and/or its prototype at a short notice of 5 days during the technical evaluation.	Undertaking for this to be submitted by the bidder.
8	Keeping in view the project requirements for delivery and SLA adherences: The bidder should have the necessary arrangement, owned/franchise logistic support capability/ Technology Partner, to ensure immediate delivery support during implementation and operations period.	An undertaking for this context should be submitted by the bidder that bidder agrees to provide the relevant documents at the award of PO such as (rent agreement/Partnership with a Technology Partner etc.)
9	The bidder must not have a history of being blacklisted by any other government organization.	Undertaking for this to be submitted by the bidder.

PART-B
(To be retained by the bidder)

Technical Requirements

<u>Sr No</u>	<u>Requirement</u>	<u>Documentation to be provided</u>
	The bidder shall undertake the establishment of a state-of-the-art Electric Vehicle training and hands-on learning lab, designated as a Centre of Excellence, in collaboration with the Institute. Supply, Installation & Commissioning of all the equipment/materials will be done by the Bidder to build the electric mobility laboratory to fulfill the required objectives. The same shall incorporate the following aspects:	
A	This Electric Vehicle Lab will encompass four distinct equipment sets. The bidder is responsible for the setup and maintenance of these equipment sets within the specified area of the institution for the total duration of 3 years of training. <ul style="list-style-type: none"> i. Dual-Wheeler Simulator and Testing Bench. ii. Charging Station Simulator and Testing Bench. iii. Embedded Systems Testing Bench. iv. Retrofit Kit to convert Internal Combustion Engine vehicles to Electric Vehicle 	Proposal to be provided with equipment details and rating.
B	The selected bidder should handle the operation and maintenance expenses for the equipment for 3 years from the date of successful commissioning and testing of the equipment.	Undertaking to be provided as a part of proposal
C	Equipment documentation including user manuals and operation and troubleshooting guides to be provided. All Test Kit, Simulator, Devices, hardware must be accompanied with User and Training Manual.	Undertaking to be provided as a part of proposal
D	To provide training to institute's team for operation and user level maintenance of the system, for up to 2 faculty members.	Undertaking to be provided as a part of proposal

E	The selected bidder shall identify and formulate training programs to develop skills in futuristic/ disruptive technologies and associated skill sets required for industry readiness in Electric Vehicle domain to be offered to students progressively over three years. For the period of first three years of engagement, the bidder shall train up to 100 learners overall in Electrical, Electronic and Mechanical domains under the programs formulated within the cost quoted in the bidding. The programs offered by the selected agency must adhere to the credit system outlined in the National Education Policy (NEP-2020).	Proposal to be submitted along with course overviews, Course Structure, curriculum & Pedagogy.
F	Having practicing Industry Experts in Core Engineering domains who can provide case studies, industry use cases to complement learning programs	Undertaking for this to be submitted by the bidder, along with details of 3 experts per domain in core engineering.
G	For all discrete components minimum 1 year warranty after training equipment handover must be confirmed by supplier.	Undertaking to be provided as a part of proposal
H	After completion of 3 years, the successful bidder shall hand over the Equipment to the institute without any additional cost.	
I	Electric Vehicle Lab readiness requirement details, as expected to be fulfilled by Government College of Engineering, Karad (Civil works, electrical works, table & chairs etc.) to be shared by the bidder within their technical bid	Details to be provided as a part of the proposal submitted for technical bidding.

Activities/Scope of the Tendering Body (to be considered by bidder while submitting the bid)

- i. To provide space for lab set up at Govt. College of Engineering, Karad for electric vehicle lab with a provision for future expansion or technology upgradation.
- ii. To provide basic amenities like approach road, water supply, furniture, and electricity supply for running of lab in addition to installation of High Voltage Transformer/Switch Yard deemed necessary.
- iii. To reimburse the expenditure incurred for the Center of excellence (all Operational expenditure and Capital expenditure) as per the timeline defined in the RFP and schedule of payment mentioned therein to the Selected Bidder.
- iv. To implement better revenue generation model suggested by the experts/ selected bidder deemed relevant for self-sustenance of the said lab obtaining consent of the above bidder.
- v. To monitor issues pertaining to students from the time from admission till issuance of Course Completion Certificate

TERMS AND CONDITIONS FORM

READ ALL THE FOLLOWING TERMS AND CONDITIONS & SIGN IN THE ACCEPTANCE

Bid Price- Bidder should quote Lumsum training cost (Consider 100 student as a committed number from the Govt College of Engineering, Karad)

Terms and Conditions:

1. The Bidder must use the entire information furnished including scope, detailed requirements of architecture of application, hardware, functional and technical specifications, other annexure, forms, enclosures etc. and other terms and conditions, bill of materials while submitting the response.
2. All responses should be in English language. All responses by the Bidders shall be binding on such Bidders.
3. All responses including commercial and technical proposals would be deemed to be irrevocable offers/proposals from the Bidders.
4. Bidders are advised to attach a letter from an authorized signatory attesting to the veracity of the information provided in the response and the validity of the tender for 90 days from the day of commercial bid opening.
5. Any technical or commercial proposal submitted cannot be withdrawn/modified after the closing date and time for submission of the proposal offers unless specifically permitted by Govt College of Engineering, Karad.
6. Each offer should specify only a single solution which is cost effective and meeting the specifications and it is the responsibility of the Bidder to decide the best of breed solution.
7. In the event the Bidder has not quoted for any mandatory or optional items as required by Govt. College of Engineering, Karad and responded to by the Bidders, the same shall be deemed to be provided by the Bidder at no extra cost to Govt College of Engineering, Karad.
8. Govt. College of Engineering, Karad concludes that everything as mentioned in the documents circulated to the Bidders and responded by the Bidders have been quoted for by the Bidders and there shall be no extra cost associated with the same other than the cost quoted by the Bidder.
9. The Bidder at no point of time can excuse themselves from any claims by Govt College of Engineering, Karad whatsoever for their deviations in conforming to the terms and conditions, payment schedules, timeframe for implementation etc. as mentioned.
10. By submitting a proposal, the Bidder agrees to promptly contract with Govt College of Engineering, Karad for any work awarded to the Bidder.
11. The clarifications or writings issued pursuant thereto shall not be construed as an obligation on the part of Govt College of Engineering, Karad to award a purchase contract for any services or combination of services.
12. The responding bidder must not be blacklisted by any Central/ any State Department/ establishments in India at any point of time for breach of ethical conduct or fraudulent practices.

13. Govt. College of Engineering, Karad reserves the right to reject any or all proposals in full without assigning any reason whatsoever.
14. The Bidder has to adhere to the time schedule of activities mentioned and no request to change the last date or extend period/time for submission shall be entertained by Govt College of Engineering, Karad. However, Govt College of Engineering, Karad reserves its right to extend the date/time for submission of the responses without assigning any reason by notifying in the Website/displayed on the Notice Board.
15. Any additional or different terms and conditions proposed by the Bidder would be rejected unless explicitly assented to, in writing by Govt College of Engineering, Karad.
16. The offers containing erasures or alterations shall not be considered. There should be no hand-written material, corrections or alterations in the offer. Correct/proper technical information of the product being offered must be filled in.
17. The response to the proposal should not carry any sections like 'Clarifications', 'As orally told', 'to be discussed', 'interpretations', 'assumptions' etc.
18. To assist in the scrutiny, evaluation and comparison of offers, Govt College of Engineering, Karad may, at its discretion, ask any of Bidders for clarifications to their offer.
19. Bid Price: Price indicated in the schedule shall be final and fix price for completion of work. The prices quoted by the bidder shall remain firm during the entire period of the contract and shall not be subject to variation on any account. The bid submitted with a variation clause unless asked by Govt College of Engineering, Karad will be treated as non-responsive and rejected.

The Principal, Government College of Engineering, Karad reserves the rights to award the tender to any party or cancel the same, without assigning any reason. The decision of the Principal in this regard will be final and conclusive.

Terms of Agreement:

1. Each of the INSTITUTE (Customer) and the COMPANY (Supplier) shall appoint a "Point of Contact" PoC who shall be the person responsible for addressing strategic relationship issues between the Parties and shall participate in the dispute resolution process. Each PoC shall possess or be able to obtain the requisite corporate power and authority to negotiate and implement, on behalf of the applicable Party, a settlement of any dispute between the Parties hereunder that is brought to its attention to resolve. The initial PoC for INSTITUTE shall be (Name), (Designation), and the initial PoC for COMPANY shall be (Name), (Designation). The INSTITUTE and the COMPANY shall each have the right, from time to time, and upon prior written notice to the other Party, to change their respective PoC. The INSTITUTE and company will also form committee to resolve dispute if any amicably in mutual understanding.
2. The Company will require its PoC to submit written report(s) on the progress of the Project (including SRS, user manuals and training reports with respect to the progress of the Company Deliverables and identification of problems and challenges) to the PoC, of the Govt College of Engineering, Karad on a periodic basis.
3. Any third party products or materials ("Third Party Components") to be incorporated into any Company Deliverables or used in the performance of Services will be specified and provided at the time of ownership handover to the INSTITUTE.

4. The INSTITUTE will ensure that appropriate INSTITUTE personnel are available as required to facilitate or enable the COMPANY's performance under this Agreement.
5. The COMPANY shall not be responsible for and shall be excused of and shall have no liability resulting from any failure to meet the timetable and deadlines or for failure to perform its obligations set out for reasons other than those solely attributable to the COMPANY and if there is a delay not caused by the COMPANY, all dates by which the COMPANY is required to perform any obligation will be deemed to be changed to a subsequent date determined by the Parties mutually, each acting reasonably and taking into account the availability of the required resources.
6. INSTITUTE will provide all the essential facilities in time to the company for completion of scope of the work without disturbance and interruption.
7. COMPANY shall be free to provide any services or design any deliverable(s) that perform same or similar functions to the Company Deliverables being provided hereunder for the INSTITUTE, for any other clients of the COMPANY (including without limitation any affiliate, competitor or potential competitor of the INSTITUTE).
8. The ownership, right, title and interest in any Intellectual Property and Intellectual Property Rights in or attached to any INSTITUTE Materials that INSTITUTE provides to COMPANY in connection with the performance of Services or for incorporation in the Licensed Material or Company Deliverable, shall remain with INSTITUTE and its applicable licensors and nothing contained in this Agreement is intended to nor shall be construed to effect any transfer of ownership rights or title in or attached to the INSTITUTE Materials, to the COMPANY.
9. The INSTITUTE shall pay the COMPANY for the Services provided by the COMPANY. The Service Fees for Services agreed to be provided is on a Fixed Price basis and the rates for any Services agreed to be performed will not vary on any grounds.
10. The COMPANY will defend, indemnify and hold harmless the INSTITUTE and its directors, officers and employees ("INSTITUTE Indemnified Party"), from and against any third-party suit, proceeding, judgment, costs and expenses (including, reasonable attorney fees) to the extent based on allegation that the Services or Company Deliverables as provided to the INSTITUTE by the COMPANY and the use thereof by the INSTITUTE as contemplated in this Agreement an infringement of or misappropriation of the copyright, patent, trademark or trade secret rights of any third party (each, an "Infringement Claim").
11. Each party (in such capacity, the "Receiving Party") acknowledges and agrees to maintain the confidentiality of Confidential Information (as hereafter defined) provided by the other party (in such capacity, the "Disclosing Party") hereunder.
12. The term of the Agreement shall commence on the Effective Date and shall continue for a period of three (03) years, unless terminated earlier in the event of material breach or proceedings of bankruptcy or similar events. In the event of any dispute between the COMPANY and the INSTITUTE, either Party shall notify the PoC of the other Party. If the PoCs of the respective Parties cannot resolve the dispute within fifteen (15) Business Days after notification thereof, they shall escalate the issue to the Committee. If the software Committee cannot resolve the dispute within fifteen (15) Business Days after reference thereof to the software Committee, the dispute shall be resolved by arbitration or litigation. The COMPANY and the INSTITUTE agree in the event of any dispute between the COMPANY and the

INSTITUTE, each Party will continue to perform its obligations under the Agreement during the resolution of such dispute, except for the obligations that may be the subject matter of such dispute. This Agreement shall be governed by and interpreted in accordance with the laws of India, without giving effect to the conflicts of law principles thereof and will be subjected to Karad Jurisdiction.

ACCEPTANCE

We accept the above terms and conditions and shall comply with them strictly.

NAME OF THE BIDDER:

ADDRESS:

Seal

SIGNATURE
Date:

Evaluation Process

1. Bids which are not in accordance with prescribed formats, or which are incomplete will be rejected on opening the same.
2. First, Technical Bids will be evaluated along with the eligibility criteria compliance. Bids, which do not confirm the eligibility criteria will be rejected outright.
3. Financial Bids will be opened only for those bids which qualify in Technical Evaluation.
4. Technical Bids will be evaluated on following points with appropriate weightages:
 - a. Profile of the Company
 - Company's existence and profitability
 - Presence in the state of Maharashtra
 - Relevant Experience in domain
 - Personnel strength
 - b. Center of Excellence – Technical Details
 - Proposed Model of Center of Excellence – with technical specifications
 - Program specifications designed for training the students with Center of Excellence
 - Provision of User manuals, reports etc. as appropriate
 - Train the trainer/faculty training program proposal
 - c. Delivery Schedule
 - d. Support and Maintenance
 - e. Compliance and/or Deviation from the requirements stipulated in the Request for Purchase.

5. It is required to declare with details if any legal case and/or process is pending against the company in any of the Courts/Statutory Authority in India or Abroad in respect of violation of Intellectual property rights or any other provisions of Government of India's Information Technology Act.

6. Financial Bid Evaluation

On the basis of Technical Bid qualification, Institute will open the Commercial Bids only of the shortlisted vendors. Institute may call the shortlisted vendors during the time of Commercial Bid opening if required.

a. Clarity of the quotation

In case of Clerical/Totaling error, higher amounts will be considered for evaluation

b. Total cost of ownership

INSTITUTE reserves the right to accept and or reject in part and or in full any and or all the bids without assigning any reason thereof.

Selection Process

The Institute is following a four stage evaluation and selection process. The stages are;

1. Eligibility evaluation
2. Technical Bid evaluation
3. Vendor Presentation/Demonstration
4. Commercial Bid evaluation

The first phase of Eligibility evaluation will include Institute checking vendor credentials, such as their prior experience of providing similar products/services, their financials, their process maturity, strength and spread of their support infrastructure & so on.

Since Institute would like to maximize its ROLE, the solution proposed by the vendors will be evaluated on the basis of the total cost of ownership, including the initial cost of ownership and recurring costs over the three years period.

Right to Termination/Cancellation:

Notwithstanding anything contained in this document, Govt. College of Engineering, Karad, reserves the right to cancel/terminate the proposal process without assigning any reason whatsoever, at any time prior to signing the contract and Govt. College of Engineering, Karad shall have no liability for above-mentioned actions.

Period of Validity of Bids

Bids should remain valid for the period of NINETY (90) days from the date of opening of bid prescribed by Govt. College of Engineering, Karad. A bid valid for a shorter period shall be rejected by the Govt. College of Engineering, Karad as non-responsive.

Liquidated Damages

In the event of the Bidder's failure to submit the performance guarantee, documents and supply the solution/equipment as per schedule specified in this Request for Purchase, Govt. College of Engineering, Karad at its discretion, can withhold any payment until the completion of the contract. Govt. College of Engineering, Karad may also deduct from the Bidder as agreed, liquidated damages to the sum of 0.5% of the contract price of the delayed/undelivered services/goods for every week of delay or part of a week, subject to the maximum value of the Liquidated Damages being not more than 10% of the value of delayed services and goods. The right to claim any liquidated damages shall be without prejudice to other rights and remedies available to Govt. College of Engineering, Karad, under the contract and law.

Annexure-I

Units and Phases to be covered in the training by the bidder :

Electric vehicle - mechanical

Phase 1

Unit1: Fundamentals of EV and Hybrid vehicles

- Introduction to Hybrid electric vehicle
- Layout design of EV
- Fundamentals of vehicle dynamics
- Aerodynamics and power train system
- Sketching of automotive EV components

Unit2: EV Battery Technology and Powertrain Development

- Introduction to vehicle dynamics
- Aerodynamics and power train system
- Sketching of automotive EV design
- Software for EV drafting and designing
- Advance EV modeling techniques using CAD software
- Advance EV analysis, FEA, CFD using different data analysis software
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Unit3: EV Design and analysis of Embedded Systems

- Essential for designing and simulation using MATLAB or similar software
- Fundamentals of EV system using MATLAB or similar software

Unit4: EV Vehicle Design & Analysis

- Advance 3D modeling techniques using latest modeling software.
- Fundamentals of EV system using MATLAB or similar software
- Analysis of EV power train components
- Simulation of EV components
- Simulation of Thermal management system for EV
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Unit5: EV Product Development and business planning

- Introduction to Business management:
- Business plan and product launch:
- Product development methods:
- Product design validation
- Design for manufacturing
- Working prototyping methods.

Unit6: EV Charging Infrastructure, Vehicle Testing & Homologation

- Cyber security for EV systems
- Vehicle parking and charging Methods
- Autonomous vehicle systems
- EV testing and Homologation
- FAME India and manufacturing guidelines
- EV certification process
- Standards for EV charging and retrofitting

Electric vehicle - mechanical

Phase 2

Unit 1: Electric vehicle Design and 3D modelling Lab

- Explore 3D modeling software
- 3D modeling of EV components
- Basic sketching techniques need for EV components
- Structure design of EV in CAD.
- Parts design of EV component
- Assembly sequencing of EV components
- Vehicle integration of EV parts
- Visualization techniques for 3D data

Unit 2: Electric vehicle design Analysis and simulation Lab

- Mesh model development in 2D
- Mesh model development in 3D
- Modelling and simulation of EV powertrain components
- 3D modelling of EV powertrain components in CAE software
- Simulation of EV powertrain components in CAE software
- EV design and structural analysis in CAE software
- FEA analysis for EV in CAE software
- CFD analysis for EV in CAE software
- Thermal Analysis of Liquid-Cooled Radiator in CAE software
- CFD Study of External Cooling Mechanism in CAE software

Electric vehicle – Electrical

Phase 1

Unit1: Fundamentals of EV and Hybrid vehicles in electric aspect

- Introduction to Hybrid electric vehicle
- Layout design of EV
- Fundamentals of vehicle dynamics
- Aerodynamics and power train system
- Sketching of automotive EV components

Unit2: EV Battery Technology and Powertrain Development

- Introduction to Batteries
- Energy Storage Systems for Software for EV drafting and designing
- Battery Pack Design and Modeling
- Advance EV analysis, FEA, CFD using different data analysis software

Unit3: EV Power Electronics and Embedded System:

- Configuration and control of DC and induction Motor drives
- Configuration and control of Permanent Magnet Motor drives
- Configuration and control of Switch Reluctance Motor drives

Unit4: EV PCB Design & Data Analytics

- Basics of PCB Design:
- Design and analysis of PCB.
- Application in EV Electrical System

Unit5: EV Vehicle Design and Analysis

- Analog and digital Electronics:
- Power Electronics:
- Trends in Power semiconductors.
- Modelling and Simulation of Electric Vehicles.

Unit6: EV Charging Infrastructure, Vehicle Testing and Homologation

- Vehicle parking and charging Methods
- Autonomous vehicle systems
- EV testing and Homologation
- FAME India and manufacturing guidelines
- EV certification process
- Standards for EV charging and retrofitting

Electric vehicle – Electrical Phase 2

Unit 1: Electric vehicle design Lab

- Introduction to booting process of raspberry pi
- Perform experiment to control the speed of dc motor
- Interface ultrasonic sensor with microcontroller and find distance
- Developing SIMULINK Models for Vehicle Units
- Design a power supply unit and create a PCB design for same
- Modelling and simulation of EV powertrain components
- Battery Management System modelling
- Modelling of Li-ion battery pack using MATLAB and ANSYS or similar software

Unit 2: Advance Electrical Vehicle Analysis and simulation Lab

- Simulation of SPWM technique for electric vehicle converter using MATLAB/Simulation
- Simulation of three phase VSI for grid integration in EV using MATLAB/Simulation.
- Design of bidirectional battery circuit using Buck/Boost converter using MATLAB/simulation.
- Modelling and Simulation of BMS for passive cell balancing in EV using MATLAB Simulation.
- Simulation of bidirectional operation in Electric Vehicle Charger using single phase model
- Modelling and simulation to calculate electric vehicle speed from motor torque
- Speed control of electric vehicle using BLDC or PMSM in MATLAB/Simulink
- Simulation of electric vehicle using MATLAB/Simulink

***All the phases and units are mandatory**

***The content of the syllabus can be similar or more than mentioned in phases and units above, however the number of phases and units will remain same.**