MAHATMA GANDHI INSTITUTE OF TECHNOLOGY (Autonomous)

Kokapet (Village), Gandipet (Mandal), Hyderabad-500 075

B.Tech Minor in Electric Vehicles

COURSE STRUCTURE & SYLLABUS (MR25 Regulations)

Applicable for the batches admitted from Academic Year 2025-26

S.No.	Semester	Course Code	Course Title	Instruction Hours Per Week			Credits
				L	T	P	
1	IV Semester	M154AF	Automobile Systems and Vehicle Dynamics	3	0	0	3
2	IV Semester	M15405	Electric Vehicles Lab	0	0	2	1
3	V Semester	M155AF	Energy Sources for EVs	3	0	0	3
4	VI Semester	M156AG	Battery Charging Technology and Battery	3	0	0	3
5	VI Semester	M15606	Battery Management System Lab	0	0	2	1
6	VII Semester	M157AR	Electric Vehicle: Safety and Regulations and Future of EVs	3	0	0	3
7	VII Semester	M15706	Project / Experiential Learning	0	0	8	4
			Total	**12**	**0**	**12**	**18**

B.Tech. Minor in Electric Vehicles
IV Semester Syllabus
M154AF: AUTOMOBILE SYSTEMS AND VEHICLE DYNAMICS

L	T	P	C
3	0	0	3

Prerequisites: Engineering Mechanics, Electrical Machines, Engineering Mathematics

Course Objectives:

1. To understand the architecture and subsystems of automobiles and EVs
2. To analyze vehicle motion, forces, and performance characteristics
3. To study vehicle dynamics (longitudinal, lateral, stability)
4. To evaluate tyres, suspension, steering, and braking systems
5. To apply concepts to electric and hybrid vehicle systems.

Course Outcomes: At the end of this course, students will be able to

1. Explain automobile subsystems and EV architectures
2. Analyze forces acting on vehicles and performance parameters
3. Apply vehicle dynamics concepts (yaw, pitch, roll, stability)
4. Evaluate tyres, suspension, steering, and braking systems
5. Analyze EV-specific dynamics and energy-performance trade-offs.

UNIT–I:

Automobile Systems and Vehicle Layout: Classification of vehicles (IC Engine, Electric Vehicles (EV), Hybrid Electric Vehicles (HEV), Plug-in Hybrid Electric Vehicles (PHEV)), Layout of automobile systems including Engine/Motor system, Transmission system, Chassis and body, Vehicle parameters such as wheelbase, track width, center of gravity (CG), Overview of EV architecture (BEV, HEV, PHEV), Automotive standards and regulations.

UNIT–II:

Vehicle Mechanics and Performance: Forces acting on a vehicle including Rolling resistance, Aerodynamic drag, Gradient resistance, Tractive effort and power requirement, Torque at wheels and transmission losses, Acceleration and deceleration analysis, Vehicle performance parameters including Maximum speed, Gradability, Acceleration time.

UNIT–III:

Vehicle Dynamics: Longitudinal dynamics including acceleration and braking forces, Lateral dynamics including cornering forces and slip angle, Vehicle motion such as Yaw, Pitch, and Roll, Load transfer (longitudinal and lateral), Stability concepts including Understeer and Oversteer, Ride and handling fundamentals.

UNIT–IV:

Tyres, Suspension and Steering Systems: Tyre construction, types, tread patterns and tyre-road interaction, Suspension systems including Passive and Active suspension, Ride comfort and damping, Steering systems including Ackermann

geometry and Power steering, Wheel alignment parameters including Camber, Caster and Toe.

UNIT–V:

Braking, Control Systems and EV Dynamics: Braking systems including Hydraulic braking and Regenerative braking in EVs, Braking performance including Stopping distance and Load transfer during braking, Stability systems including Anti-lock Braking System (ABS) and Electronic Stability Control (ESC), Vehicle safety including Active and Passive safety systems, Introduction to ADAS, Electric Vehicle dynamics including Battery weight distribution, Motor torque characteristics, Drive cycles and energy efficiency.

TEXT BOOKS:

1. Thomas D. Gillespie, "Fundamentals of Vehicle Dynamics", SAE International, 1st Edition, 1992.
2. J.Y. Wong, "Theory of Ground Vehicles", Wiley, 4th Edition, 2008.
3. P.S. Gill, "Automobile Engineering", S.K. Kataria & Sons, 9th Edition, 2014.

REFERENCES:

1. Robert Bosch GmbH, "Automotive Handbook", Wiley, 10th Edition, 2018.
2. Rajesh Rajamani, "Vehicle Dynamics and Control", Springer, 2nd Edition, 2012.
3. James Larminie, John Lowry, "Electric Vehicle Technology Explained", Wiley, 2nd Edition, 2012.
4. Iqbal Husain, "Electric and Hybrid Vehicles: Design Fundamentals", CRC Press, 2nd Edition, 2011.
5. Heinz Heisler, "Advanced Vehicle Technology", Butterworth-Heinemann, 2nd Edition, 2002.
6. Giancarlo Genta, Lorenzo Morello, "The Automotive Chassis: Engineering Principles", Springer, 1st Edition, 2009.

WEB RESOURCES / URLs:

1. NPTEL Course – Vehicle Dynamics https://nptel.ac.in/courses/112106283
2. NPTEL Course – Electric Vehicles https://nptel.ac.in/courses/108102121
3. MIT OpenCourseWare – Vehicle Dynamics & Control https://ocw.mit.edu
4. SAE International (Automotive Standards & Research) https://www.sae.org
5. Bosch Mobility Solutions (Automotive Systems Reference) https://www.bosch-mobility.com
6. EV Database (Real-world EV specifications & performance) https://ev-database.org
7. MathWorks (MATLAB Vehicle Modeling & Simulation Resources) https://www.mathworks.com/solutions/automotive.html
8. Coursera – Electric Vehicle Courses https://www.coursera.org/courses?query=electric%20vehicles

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IV Semester Syllabus

M15405: ELECTRIC VEHICLES LAB

L	T	P	C
0	0	2	1

Prerequisites: Electrical Machines, Power Electronics, Electric Vehicles

Course Objectives:

1. Familiarize with components and subsystems of electric vehicles
2. Understand battery characteristics, charging, and energy storage systems
3. Study performance analysis of EV drives and motors
4. Learn Battery Management System (BMS) basics and monitoring techniques
5. Acquire practical skills in testing, simulation, and analysis of EV systems.

Course Outcomes: At the end of this course, students will be able to

1. Perform experiments on EV components such as batteries, motors, and converters
2. Analyse charging characteristics and battery performance parameters
3. Evaluate efficiency and performance of EV drive systems
4. Understand and implement basic BMS functions (SOC, voltage monitoring)
5. Apply laboratory skills to real-world EV applications and systems.

The following experiments are required to be conducted as compulsory experiments:

1. Study and simulation of Sinusoidal PWM Algorithm using MATLAB.

2. Analysis of Buck- Boost Converter for Electric Vehicles.

3. Study of electric vehicle architecture and components
   - MATLAB / Simulink → System-level EV modeling
   - Open Modelica → EV system block modeling

4. Charge and discharge characteristics of Lithium-ion battery
   - MATLAB → Battery modeling & curves
   - Python → Data analysis & plotting

5. Speed control of DC motor/BLDC motor using power electronic converter
   - PSIM → Converter design
   - PLECS → Control system simulation
   - MATLAB → Control algorithms

6. Study of battery charging methods (CC-CV charging)
   - MATLAB → Charging profile simulation
   - LTspice → Charger circuit analysis

7. Simulation of EV drive system using MATLAB/Simulink
   - MATLAB / Simulink → Full EV system simulation

8. Study of Battery Management System (BMS) for monitoring voltage and temperature
   - MATLAB → BMS modeling
   - LabVIEW → Real-time monitoring
   - Python → Data processing

In addition to the above experiments, at least any two of the following

experiments are required to be conducted from the following list:

1. Performance comparison of EV and IC engine vehicle
   - MATLAB → Performance modeling
   - CarSim → Realistic vehicle simulation

2. Study of regenerative braking system
   - MATLAB → Energy recovery modeling
   - PLECS → Converter + braking system

3. Analysis of DC-DC converters used in EV applications
   - PSIM → Converter analysis
   - LTspice → Circuit-level simulation

4. Thermal analysis of battery pack
   - ANSYS → Thermal modeling
   - MATLAB → Simplified thermal models

5. Study of EV charging station and charging standards
   - MATLAB → Charging system modeling
   - Open Modelica → Grid integration

6. Performance analysis of BLDC motor used in EVs
   - MATLAB / Simulink → Motor modeling
   - PLECS → Drive simulation

7. Measurement of State of Charge (SOC) and battery parameters
   - MATLAB → SOC estimation algorithms
   - Python → ML/advanced SOC estimation

RECOMMENDED SOFTWARE STACK:

- EV System Modelling: MATLAB/Simulink, Open Modelica
- Battery Analysis: MATLAB, Python
- Motor & Drives: MATLAB, PLECS
- Power Electronics: PSIM, LTspice
- BMS: MATLAB, Lab VIEW
- Thermal Analysis: ANSYS
- Vehicle Dynamics: Car Sim

TEXT BOOKS:

1. James Larminie, John Lowry, "Electric Vehicle Technology Explained", Wiley, 2nd Edition, 2012.
2. Iqbal Husain, "Electric and Hybrid Vehicles: Design Fundamentals", CRC Press, 2nd Edition, 2011.

REFERENCES:

1. Mehrdad Ehsani, Yimin Gao, Sebastien Gay, Ali Emadi, "Modern Electric, Hybrid Electric, and Fuel Cell Vehicles", CRC Press, 2009.
2. Gregory L. Plett, "Battery Management Systems", Artech House, 2015.
3. K.T. Chau, "Electric Vehicle Machines and Drives", Wiley, 2015.
4. Chris Mi, M. Abul Masrur, David Gao, "Hybrid Electric Vehicles: Principles and Applications", Wiley, 2011.

B.Tech. Minor in Electric Vehicles
V Semester Syllabus
M155AF: ENERGY SOURCES FOR EVs

L	T	P	C
3	0	0	3

Prerequisites: Engineering Chemistry, Engineering Physics, Electrical Circuits and Machines

Course Objectives:

1. To understand various energy sources used in electric vehicles
2. To study battery technologies and energy storage systems
3. To analyze fuel cells and alternative energy sources
4. To evaluate charging systems and infrastructure
5. To understand energy management and sustainability aspects.

Course Outcomes: At the end of this course, students will be able to

1. Explain various energy sources used in electric vehicles
2. Analyze battery technologies and performance parameters
3. Evaluate advanced energy storage systems for EV applications
4. Understand fuel cells and alternative energy technologies
5. Analyze EV charging systems and energy management strategies.

UNIT–I:
Introduction to Energy Sources for EVs: Energy scenario and need for alternative energy sources, Classification of energy sources (conventional and non-conventional), Overview of electric vehicle energy requirements, Comparison of IC engine vehicles and EV energy consumption, Energy efficiency and environmental impact, Basics of energy storage systems.

UNIT–II:
Battery Technologies for EVs: Fundamentals of batteries, Battery parameters (capacity, energy density, power density, efficiency, cycle life), Types of batteries used in EVs (Lead-acid, Nickel-Metal Hydride, Lithium-ion, Solid-state batteries), Battery chemistry and working principles, Battery selection criteria for EVs, Thermal management of batteries.

UNIT–III:
Advanced Energy Storage Systems: Super capacitors and ultra-capacitors, Flywheel energy storage, Hybrid energy storage systems, Comparison of batteries and super capacitors, Applications in EVs, Energy storage system modeling and performance characteristics.

UNIT–IV:
Fuel Cells and Alternative Energy Sources: Introduction to fuel cells, Types of fuel cells (PEMFC, SOFC, AFC), Hydrogen production and storage methods, Fuel cell characteristics and efficiency, Solar energy integration in EVs, Hybrid energy systems combining batteries and fuel cells.

UNIT–V:

Charging Systems and Energy Management: EV charging methods (AC and DC charging), Charging standards and infrastructure, Wireless charging basics, Battery Management System (BMS), State of Charge (SOC) and State of Health (SOH) estimation, Energy management strategies in EVs, Smart grid integration and sustainability aspects.

TEXT BOOKS:

1. James Larminie, John Lowry, "Electric Vehicle Technology Explained", Wiley, 2nd Edition, 2012.
2. Iqbal Husain, "Electric and Hybrid Vehicles: Design Fundamentals", CRC Press, 2nd Edition, 2011.
3. Mehrdad Ehsani, Yimin Gao, Sebastien Gay, Ali Emadi, "Modern Electric, Hybrid Electric, and Fuel Cell Vehicles", CRC Press, 2nd Edition, 2009.

REFERENCES:

1. Sheldon S. Williamson, "Energy Management Strategies for Electric and Plug-in Hybrid Electric Vehicles", Springer, 2013.
2. Jiuchun Jiang, "Fundamentals and Applications of Lithium-ion Batteries in Electric Drive Vehicles", Wiley, 2015.
3. K.T. Chau, "Electric Vehicle Machines and Drives: Design, Analysis and Application", Wiley, 2015.
4. Bent Sørensen, "Hydrogen and Fuel Cells: Emerging Technologies and Applications", Elsevier, 2nd Edition, 2012.
5. Chris Mi, M. Abul Masrur, David Wenzhong Gao, "Hybrid Electric Vehicles: Principles and Applications", Wiley, 2011.
6. Tariq Muneer, "Electric Vehicles: Prospects and Challenges", Elsevier, 2017.

WEB RESOURCES / URLs:

1. NPTEL – Electric Vehicles Course https://nptel.ac.in/courses/108102121
2. NPTEL – Energy Storage Systems https://nptel.ac.in/courses/108105058
3. U.S. Department of Energy – EV & Battery Resources https://www.energy.gov
4. International Energy Agency (IEA) – EV Outlook https://www.iea.org
5. EV Database (Battery & Performance Data) https://ev-database.org
6. MathWorks – EV Modeling & Battery Systems https://www.mathworks.com/solutions/electric-vehicles.html
7. SAE International – EV Standards https://www.sae.org

B.Tech. Minor in Electric Vehicles
VI Semester Syllabus

M156AG: BATTERY CHARGING TECHNOLOGY AND BATTERY MANAGEMENT SYSTEM

L	T	P	C
3	0	0	3

Prerequisites: Electrical Circuits, Power Electronics, Engineering Chemistry, Electrical Machines Electric Vehicles, Energy Storage Systems

Course Objectives:

1. To understand battery charging principles and methods for EVs
2. To study charging standards, infrastructure, and power electronics interfaces
3. To analyze Battery Management System (BMS) architecture and functions
4. To evaluate battery monitoring, protection, and balancing techniques
5. To understand thermal management, safety, and lifecycle optimization of batteries.

Course Outcomes: At the end of this course, students will be able to

1. Explain battery charging methods and EV charging infrastructure
2. Analyze power electronic converters used in battery charging
3. Understand BMS architecture and state estimation techniques
4. Evaluate battery protection, balancing, and thermal management methods
5. Analyze advanced charging technologies and battery lifecycle management.

UNIT–I:
Introduction to Battery Charging Systems: Overview of battery technologies used in EVs, charging requirements and characteristics of batteries, charging curves and profiles (CC, CV, CC-CV methods), Types of chargers (on-board and off-board), AC and DC charging basics, Charging efficiency and losses, Introduction to EV charging standards and protocols.

UNIT–II:
Charging Infrastructure and Power Electronics: EV charging infrastructure, Levels of charging (Level 1, Level 2, DC fast charging), Conductive and wireless charging systems, Power electronic converters for charging (AC-DC rectifiers, DC-DC converters), Grid integration and impact on power systems, Smart charging and vehicle-to-grid (V2G) concepts.

UNIT–III:
Battery Management System (BMS) Fundamentals: Functions of BMS, BMS architecture (centralized, distributed, modular), Battery parameters monitoring (voltage, current, temperature), State estimation techniques (State of Charge (SOC), State of Health (SOH), State of Power (SOP)), Data acquisition and communication in BMS.

UNIT–IV:
Battery Protection, Balancing and Thermal Management: Protection mechanisms (overvoltage, undervoltage, overcurrent, short circuit), Cell balancing techniques (passive and active balancing), Thermal management systems (air

cooling, liquid cooling, phase change materials), Safety standards and reliability considerations, Fault detection and diagnostics.

UNIT–V:
Advanced BMS and Charging Technologies: Advanced charging techniques (fast charging, ultra-fast charging), Wireless charging and inductive power transfer, AI-based battery management and predictive maintenance, Battery degradation and lifecycle analysis, Second-life applications of EV batteries, Recycling and sustainability aspects.

TEXT BOOKS:
1. James Larminie, John Lowry, "Electric Vehicle Technology Explained", Wiley, 2nd Edition, 2012.
2. Iqbal Husain, "Electric and Hybrid Vehicles: Design Fundamentals", CRC Press, 2nd Edition, 2011.
3. Gregory L. Plett, "Battery Management Systems, Volume I: Battery Modeling", Artech House, 2015.

REFERENCES:
1. Gregory L. Plett, "Battery Management Systems, Volume II: Equivalent-Circuit Methods", Artech House, 2015.
2. Jiuchun Jiang, "Fundamentals and Applications of Lithium-ion Batteries in Electric Drive Vehicles", Wiley, 2015.
3. Chris Mi, M. Abul Masrur, David Wenzhong Gao, "Hybrid Electric Vehicles: Principles and Applications", Wiley, 2011.
4. Sheldon S. Williamson, "Energy Management Strategies for Electric and Plug-in Hybrid Electric Vehicles", Springer, 2013.
5. Tariq Muneer, "Electric Vehicles: Prospects and Challenges", Elsevier, 2017.
6. K.T. Chau, "Electric Vehicle Machines and Drives: Design, Analysis and Application", Wiley, 2015.

WEB RESOURCES / URLs:
1. NPTEL – Electric Vehicles Course https://nptel.ac.in/courses/108102121
2. NPTEL – Power Electronics https://nptel.ac.in/courses/108101038
3. U.S. Department of Energy – EV Charging & Batteries https://www.energy.gov
4. International Energy Agency (IEA) – EV Reports https://www.iea.org
5. EV Database (Charging & Battery Specs) https://ev-database.org
6. MathWorks – Battery Management System Modeling https://www.mathworks.com/solutions/electric-vehicles.html
7. SAE International – Charging Standards (J1772, CCS) https://www.sae.org

B.Tech. Minor in Electric Vehicles

VI Semester Syllabus

M15606: BATTERY MANAGEMENT SYSTEM LABORATORY

L	T	P	C
0	0	2	1

Prerequisites: Electrical Circuits, Power Electronics, Battery Technology, Electric Vehicles

Course Objectives:

1. Familiarize with battery management system (BMS) architecture and components
2. Understand battery monitoring parameters (voltage, current, temperature)
3. Study State of Charge (SOC) and State of Health (SOH) estimation methods
4. Learn battery protection, balancing, and thermal management techniques
5. Acquire practical skills in BMS implementation and simulation.

Course Outcomes: At the end of this course, students will be able to

1. Perform experiments on battery monitoring and parameter estimation
2. Analyze charging/discharging characteristics and SOC/SOH estimation
3. Implement basic BMS functions including protection and balancing
4. Evaluate battery safety and thermal management techniques
5. Apply laboratory skills to real-time BMS and EV battery applications.

The following experiments are required to be conducted as compulsory experiments:

1. Study of Battery Management System architecture and components
   - MATLAB / Simulink → BMS block diagram and system modelling
   - Python → Concept visualization

2. Measurement of battery voltage, current, and temperature parameters
   - LabVIEW → Real-time monitoring & data acquisition
   - MATLAB → Data logging and analysis

3. Estimation of State of Charge (SOC) using different methods
   - MATLAB → Coulomb counting, Kalman filter methods
   - Python → AI/ML-based SOC estimation

4. Study of State of Health (SOH) estimation techniques
   - MATLAB → Degradation modelling
   - Python → Data-driven SOH prediction

5. Implementation of battery protection (overvoltage & overcurrent, thermal protection)
   - PLECS → Protection circuit simulation
   - LTspice → Circuit-level protection design

6. Study of cell balancing techniques (passive balancing)
   - MATLAB → Balancing algorithm simulation
   - PLECS → Circuit-based balancing

7. Analysis of charging and discharging characteristics of Lithium-ion battery
    - MATLAB → Charge-discharge curves
    - Python → Data analysis & visualization

8. Simulation of BMS using MATLAB/Simulink
    - MATLAB / Simulink → Complete BMS simulation

In addition to the above experiments, at least any two of the following experiments are required to be conducted from the following list:

1. Implementation of active cell balancing technique
    - PLECS → Active balancing circuits
    - MATLAB → Control strategies

2. Thermal analysis of battery pack using simulation tools
    - ANSYS → Thermal modelling
    - MATLAB → Simplified thermal models

3. Development of SOC estimation algorithm using Python/MATLAB
    - Python → Algorithm implementation
    - MATLAB → Model validation

4. Study of Battery Management ICs and communication protocols (CAN)
    - LabVIEW → CAN communication interface
    - MATLAB → Data communication simulation

5. Fault detection and diagnostics in battery systems
    - MATLAB → Fault modelling
    - Python → AI-based diagnostics

TECHNICAL SOFTWARE FOR IMPLEMENTATION:

1. BMS Modelling: MATLAB/Simulink
2. SOC/SOH Estimation: MATLAB, Python
3. Protection Circuits: PLECS, LTspice
4. Cell Balancing: MATLAB, PLECS
5. Data Acquisition: LabVIEW
6. Thermal Analysis: ANSYS
7. Fault Diagnostics: MATLAB, Python

TEXT BOOKS:

1. Gregory L. Plett, "Battery Management Systems, Volume I: Battery Modeling", Artech House, 2015.
2. James Larminie, John Lowry, "Electric Vehicle Technology Explained", Wiley, 2nd Edition, 2012.

REFERENCES:

1. Gregory L. Plett, "Battery Management Systems, Volume II: Equivalent-Circuit Methods", Artech House, 2015.
2. Jiuchun Jiang, "Fundamentals and Applications of Lithium-ion Batteries in Electric Drive Vehicles", Wiley, 2015.
3. Iqbal Husain, "Electric and Hybrid Vehicles: Design Fundamentals", CRC Press, 2nd Edition, 2011.
4. Chris Mi, M. Abul Masrur, David Gao, "Hybrid Electric Vehicles: Principles and Applications", Wiley, 2011.

B.Tech. Minor in Electric Vehicles

VII Semester Syllabus

M157AR: ELECTRIC VEHICLE: SAFETY AND REGULATIONS AND FUTURE OF EVs

L	T	P	C
3	0	0	3

Prerequisites: Electrical Circuits, Power Systems, Electric Vehicles, Energy Storage Systems, Power Electronics, Electrical Safety, Engineering Physics

Course Objectives:

1. To understand safety aspects in electric vehicles and high-voltage systems
2. To study national and international EV regulations and standards
3. To analyze battery safety, thermal risks, and protection mechanisms
4. To evaluate testing, certification, and compliance procedures
5. To explore future trends, technologies, and policies in EVs.

Course Outcomes: At the end of this course, students will be able to

1. Understand safety requirements and hazards in electric vehicles
2. Analyze battery safety issues and thermal management techniques
3. Interpret EV regulations and global standards
4. Apply functional safety concepts and testing procedures
5. Evaluate future trends, policies, and sustainability aspects of EVs.

UNIT–I:

Introduction to EV Safety: Overview of electric vehicle systems and associated risks, High-voltage safety in EVs, Electrical hazards and insulation requirements, Safety standards for EV components, Personal safety practices and protective equipment, Introduction to functional safety concepts.

UNIT–II:

Battery Safety and Thermal Management: Battery hazards and failure modes, Thermal runaway and its causes, Battery safety standards and testing procedures, Protection mechanisms in battery packs, Thermal management systems for safety, Fire safety and emergency response in EVs.

UNIT–III:

EV Regulations and Standards: Overview of global EV standards, Indian EV regulations (AIS, BIS standards), International standards (ISO, IEC), Charging standards and protocols, Homologation and certification processes, Environmental regulations and compliance.

UNIT–IV:

Functional Safety and Testing: Functional safety standards (ISO 26262), Hazard analysis and risk assessment (HARA), Fault detection and diagnostics, Safety integrity levels (ASIL), Testing methods for EV components and systems, Reliability and validation procedures.

UNIT–V:

Future of Electric Vehicles: Emerging technologies in EVs (solid-state batteries, autonomous EVs), Smart mobility and connected vehicles, Vehicle-to-Grid (V2G) and smart grid integration, Policy frameworks and government initiatives, Sustainability, recycling, and second-life applications of batteries, Future challenges and opportunities in EV ecosystem.

TEXT BOOKS:

1. Iqbal Husain, "Electric and Hybrid Vehicles: Design Fundamentals", CRC Press, 2nd Edition, 2011.
2. James Larminie, John Lowry, "Electric Vehicle Technology Explained", Wiley, 2nd Edition, 2012.
3. Mehrdad Ehsani, Yimin Gao, Sebastien Gay, Ali Emadi, "Modern Electric, Hybrid Electric, and Fuel Cell Vehicles", CRC Press, 2nd Edition, 2000.

REFERENCES:

1. Tariq Muneer, "Electric Vehicles: Prospects and Challenges", Elsevier, 2017.
2. Sheldon S. Williamson, "Energy Management Strategies for Electric and Plug-in Hybrid Electric Vehicles", Springer, 2013.
3. International Organization for Standardization Standards – ISO 26262 (Road Vehicle Functional Safety).
4. International Electrotechnical Commission Standards – IEC 62133 (Battery Safety). Automotive Research Association of India – AIS Standards for EVs.
5. Society of Automotive Engineers – EV charging and safety standards.

WEB RESOURCES / URLs:

1. NPTEL – Electric Vehicles Course https://nptel.ac.in/courses/108102121
2. Ministry of Road Transport & Highways (India – EV Policies) https://morth.nic.in
3. Bureau of Indian Standards (BIS) https://www.bis.gov.in
4. International Energy Agency (IEA – Global EV Outlook) https://www.iea.org
5. SAE International (EV Standards & Research) https://www.sae.org
6. ISO Standards Information https://www.iso.org
7. IEC Standards (Battery & Electrical Safety) https://www.iec.ch