EDUFYI TECH SOLUTIONS

Virtual Internships · Industry Training · Placements

SPECIALISED PROFESSIONAL PROGRAM · 2026

HYBRID ELECTRIC VEHICLES

Powertrain architectures · Battery Management Systems · Motor control · Power electronics · Model-Based Design with MATLAB/Simulink · Functional safety.

6	150+	24×7	100%
Capstone Projects	Hiring Partners	Mentor Support	Placement Assistance

OUR ALUMNI WORK AT

Microsoft · BOSCH · Capgemini · Deloitte · IBM · Adobe · EY · TATA

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PROGRAM CODE HEV-PRO-26

ABOUT THE INSTITUTE

Who we are, and why learners choose us

Edufyi Tech Solutions transforms the college-to-career journey with virtual internships and industry-grade training. Every learner ships six real-time and capstone projects under mentors working at MNCs and funded startups.

18.94%	6	40+	BS6354
Hybrid market CAGR	Industry projects	Live mentor hours	Wipro DICE ID

WHY CHOOSE US

01 **Flexible pacing**
Choose your speed, master the skills

02 **Industry playground**
Real OEM & Tier-1 style problem statements

03 **Career grooming**
Resume, aptitude, unlimited mocks & GDs

04 **MNC mentors**
Engineers from MNCs and startup founders

05 **Placement support**
100% assistance + 150+ hiring partners

06 **R&D content**
Exclusive research material from leading MNCs

07 **Global certification**
Wipro DICE ID accredited certificates

08 **Partner badges**
Microsoft, Cisco, IBM, Adobe, Autodesk

09 **Lifetime LMS**
Recorded lectures, anytime, anywhere

10 **Paid performance**
Performance based stipend opportunities

11 **1:1 counselling**
Personal roadmap and progress reviews

12 **24×7 support**
Dedicated doubt-resolution desk

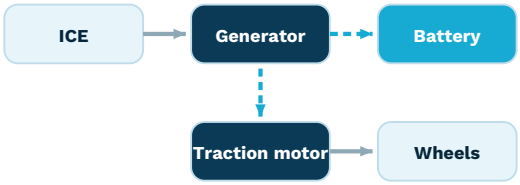
DOMAIN PRIMER

What is a hybrid electric vehicle?

An HEV pairs an internal combustion engine with an electric propulsion system. Depending on the architecture, the electric path assists the engine, recovers braking energy, or drives the wheels on its own — improving efficiency, torque response and emissions.

Series hybrid

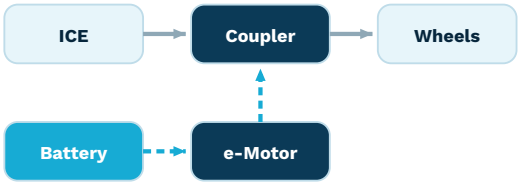
ICE → GEN → MOTOR



Engine never drives the wheels — pure electric traction.

Parallel hybrid

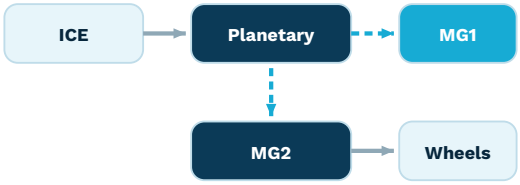
ICE + MOTOR → WHEELS



Both sources torque the same driveline.

Power-split (series-parallel)

PLANETARY SET



eCVT behaviour — Toyota THS style.

DEGREE OF HYBRIDISATION

Micro	12V	Start-stop only
Mild	48V	Torque assist + regen
Full	200–400V	EV-only launch
PHEV	400V+	Grid chargeable, 40–80 km EV
REx	400V+	Range extender genset

HOW THE THREE POWERTRAINS COMPARE

PARAMETER	ICE	HEV	BEV
Tank-to-wheel efficiency	20–30%	35–45%	77–90%
Regenerative braking	None	Yes	Yes
Charging dependency	None	Optional	Essential
Tailpipe CO_2	High	Reduced 25–40%	Zero
Powertrain complexity	Low	High (dual path)	Moderate

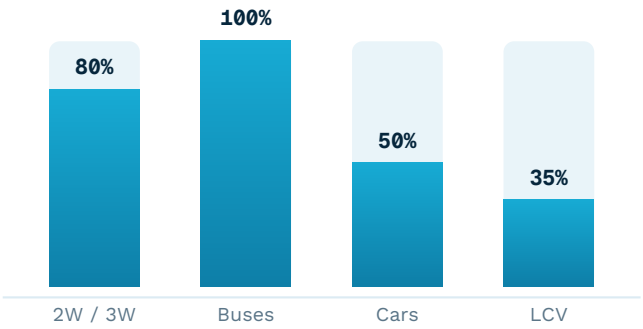
MARKET OUTLOOK

Scope of hybrid electric vehicles

Hybrids bridge the gap between combustion and full-electric mobility. With better cells, power electronics and software, they deliver efficiency today while charging infrastructure scales.

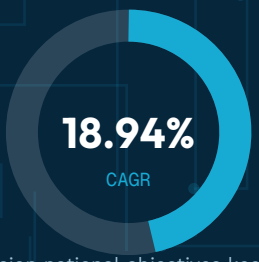
India electrification outlook · 2035

Share of new vehicle sales expected to be electrified



Hybrid market CAGR

2020 → 2030, by volume



Zero-emission national objectives keep funding and demand strong.

WHAT MAKES THIS PROGRAM ADVANCED

Model-Based Design
Simulink plant + controller, HIL-ready

Battery intelligence
SoC/SoH estimation with Kalman filters

Motor control
FOC for PMSM, space-vector PWM

Vehicle networks
CAN / CAN-FD, UDS diagnostics, AUTOSAR

Thermal & safety
Liquid cooling, ISO 26262, AIS-156

Energy management
Rule-based, ECMS and RL strategies

EMERGING TECHNOLOGY WATCHLIST · 2026

- 800 V architectures & SiC traction inverters
- Sodium-ion and silicon-anode chemistries
- Vehicle-to-grid (V2G) and smart charging
- OTA updates and software-defined vehicles
- Cell-to-pack and structural battery designs
- AI-driven BMS and predictive SoH analytics
- Digital twins for pack and drivetrain
- Hydrogen fuel-cell hybrid powertrains

SPECIALISED CURRICULUM

Program curriculum · modules 01 – 05

Eight structured modules blend theory, hands-on labs and mentor-led design reviews. Each module closes with a graded assessment and a code or model deliverable.

01 HEV & EV Foundations

Live + LMS · 6 hrs

- Powertrain taxonomy: micro, mild, full, PHEV, REx, FCEV
- Vehicle dynamics: road load, rolling & aero resistance
- Otto / Atkinson cycles, BSFC maps and engine downsizing
- Regenerative braking energy budget and blending
- Well-to-wheel emissions and lifecycle CO_2 accounting

02 Energy Storage & Battery Systems

Live + Lab · 8 hrs

- Li-ion chemistries: NMC, LFP, LTO, and solid-state roadmap
- Cell modelling: OCV-R-RC equivalent circuits, parameter ID
- Pack design: series/parallel topology, busbars, fusing
- Ultracapacitors, flywheels and hybrid storage sizing
- Ageing, calendar/cycle life and second-life applications

03 Battery Management Systems (BMS)

Live + Project · 8 hrs

- SoC estimation: coulomb counting, EKF & UKF observers
- SoH / SoP estimation and impedance tracking
- Active vs passive cell balancing circuits
- Contactor control, precharge, insulation & HVIL monitoring
- Functional safety concept for a BMS ECU

04 Electric Machines & Motor Control

Live + Lab · 8 hrs

- PMSM, IPM, induction and SRM comparison for traction
- Clarke/Park transforms and Field Oriented Control
- Space-vector PWM, current loop tuning, dead-time effects
- Field weakening and MTPA operation for wide speed range
- Torque-speed envelope, efficiency maps, thermal derating

05 Power Electronics & Charging

Live + Lab · 8 hrs

- Traction inverters: IGBT vs SiC MOSFET trade-offs
- Bidirectional DC-DC converters and 48V architectures
- On-board charger, PFC stages and V2G / V2L power flow
- EVSE: AC Level 1/2, DC fast charging, CCS2 & GB/T
- ISO 15118 plug-and-charge, OCPP and smart charging

SPECIALISED CURRICULUM

Program curriculum · modules 06 – 08

The second half moves from components to the complete vehicle: embedded software, model-based design, thermal safety and Indian policy landscape.

06

Embedded Software & Vehicle Networks

Live + Project · 8 hrs

- Automotive E/E architecture: domain vs zonal controllers
- CAN, CAN-FD, LIN, FlexRay and Automotive Ethernet
- UDS diagnostics, DTCs and secure flash bootloaders
- AUTOSAR Classic basics, RTE and MCAL layers
- Cybersecurity essentials: ISO/SAE 21434 overview

07

Model-Based Design & Simulation

Lab intensive · 10 hrs

- MATLAB / Simulink / Simscape plant modelling
- Drive-cycle simulation: MIDC, WLTP, FTP-75
- Energy management: rule-based, ECMS and DP benchmarks
- Auto-code generation, SIL / MIL / PIL and HIL testing
- Digital twin & OTA-ready calibration workflow

08

Thermal, Safety, Policy & Industry

Live · 6 hrs

- Battery & inverter thermal management, thermal runaway
- ISO 26262 ASIL decomposition and FMEA / FTA basics
- Homologation: AIS-038 Rev 2, AIS-156, BS-VI hybrids
- FAME-II, PM E-DRIVE, PLI schemes and demand incentives
- Charging infrastructure, battery swapping and business models

HOW EVERY MODULE IS DELIVERED

Live sessions
Instructor-led classes with recorded playback

Guided labs
Simulink, MATLAB and embedded C workbenches

Design reviews
Mentor critique on every model and report

Graded assessment
Quiz + deliverable scored against a rubric

ADVANCED ELECTIVES

- Reinforcement-learning energy management
- Battery ageing & second-life analytics
- Fuel-cell hybrid powertrain modelling
- HIL bench setup with dSPACE-style rigs

APPLIED LEARNING

Six advanced industry projects

Every learner ships a portfolio of six graded projects, reviewed by mentors and packaged with documentation, test evidence and a demo video.

P1 **48V mild-hybrid belt-starter-generator model**
SIMULINK · DRIVE CYCLE

P2 **EKF-based SoC estimator for an NMC pack**
MATLAB · VALIDATION DATA

P3 **FOC controller for a 60 kW traction PMSM**
SIMULINK · SVPWM

P4 **CAN-based BMS dashboard with UDS diagnostics**
EMBEDDED C · CANOE-STYLE

P5 **ECMS energy management for a power-split HEV**
OPTIMISATION · DP BENCHMARK

P6 **Fast-charging & thermal study of a 400V pack**
THERMAL · CCS2 PROFILE

TOOLCHAIN YOU WILL MASTER

- MATLAB
- Simulink
- Simscape
- Stateflow
- Embedded C
- Python
- CANoe / CANalyzer
- Altium basics
- ANSYS Thermal
- GT-SUITE intro
- AUTOSAR
- Git

CAPSTONE SHOWCASE

Final demo day with hiring partners · portfolio + GitHub + technical viva

EVERY PROJECT SHIPS WITH

Requirement sheet
Scoped specification and acceptance criteria

Model / source code
Version-controlled Simulink model or C project

Test evidence
Drive-cycle results, plots and validation log

Technical report
Design rationale, trade-offs and conclusions

Demo video
Three-minute walkthrough for recruiters

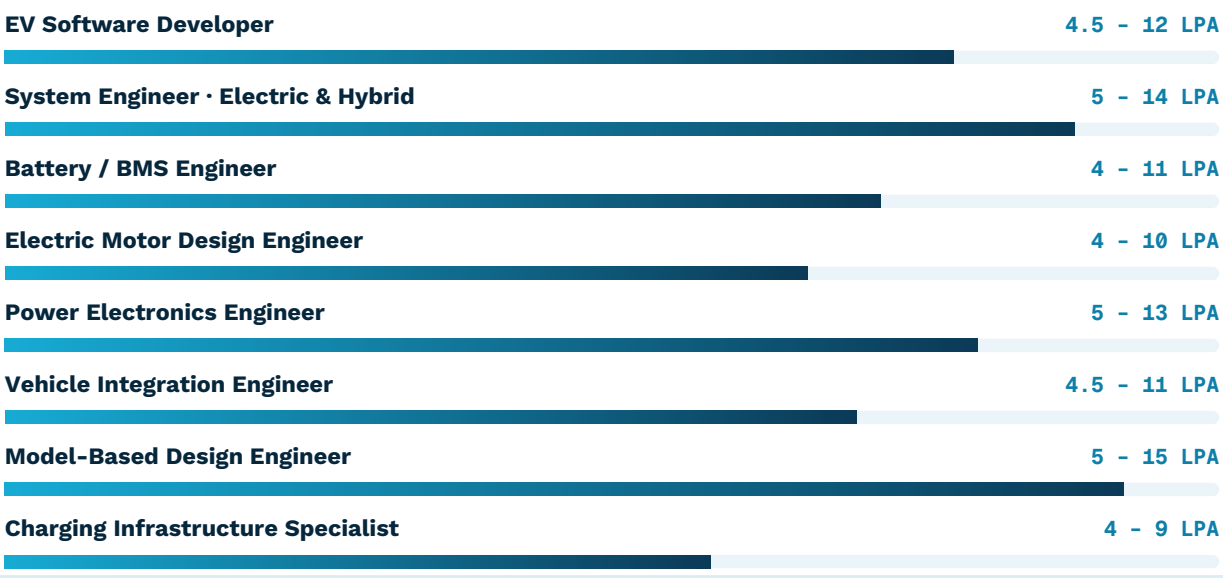
Mentor score
Rubric grading with improvement feedback

OUTCOMES

Career opportunities & salary bands

Hybrid and EV programs at OEMs, Tier-1 suppliers and mobility startups hire across software, electrical and systems disciplines.

Role demand index & typical fresher-to-3yr band



HOW TO START YOUR JOURNEY

01 — Enroll
Pick your cohort & pace

02 — Learn
Live + LMS modules

03 — Build
6 mentor-reviewed projects

04 — Get hired
Interviews with partners

WHERE OUR LEARNERS GET HIRED

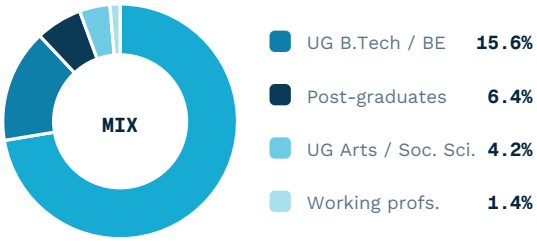
- **OEMs** — Tata Motors, Mahindra, Ashok Leyland class
- **Tier-1 suppliers** — Bosch, Valeo, Continental class
- **EV startups** — Battery, charging and drivetrain ventures
- **Engineering services** — R&D centres and MBD consultancies

PROOF

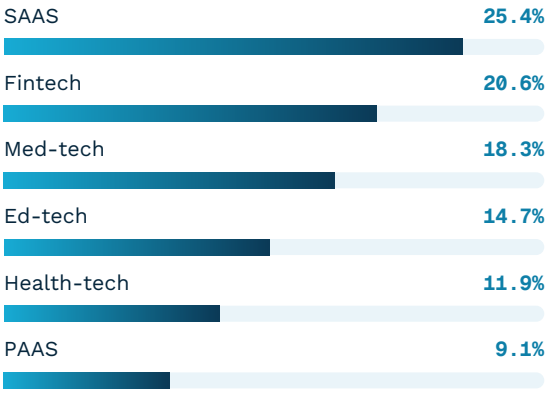
Placement & learner analytics

Transparent reporting on who learns with us, where they get placed and when offers land.

Learner background

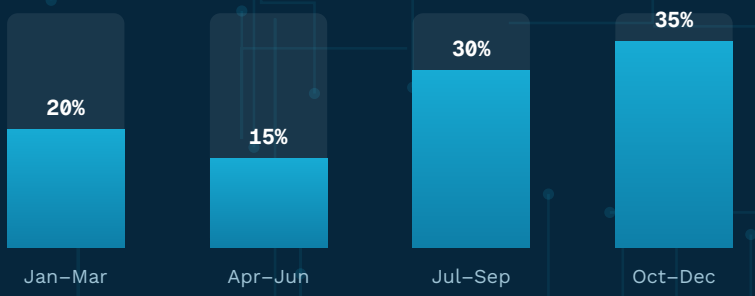


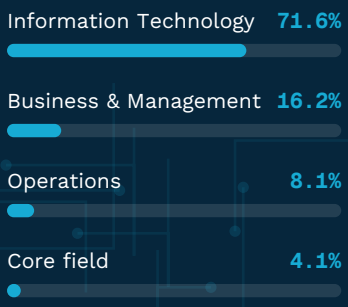
Placements by industry



Quarterly placement analysis

Share of annual offers released per quarter





CAREER SUPPORT INCLUDED

Resume & portfolio

ATS-ready CV plus a documented project portfolio

Mock interviews

Technical + HR rounds with domain mentors

Referral network

Introductions to hiring partners each cohort

CREDENTIALS

Certifications you walk away with

Wipro DICE ID accredited certificates plus globally recognised professional badges from our authorised certification partners.

EDUFYI TECH SOLUTIONS

INTERNSHIP

Completion

Powered by Wipro DICE ID

EDUFYI TECH SOLUTIONS

PROJECT

Completion

Six graded capstone projects

EDUFYI TECH SOLUTIONS

INDUSTRIAL

Training

Domain specialisation record

AUTHORISED CERTIFICATION PARTNERS

- **Microsoft**
- **Cisco**
- **IBM**
- **Adobe**
- **Autodesk**
- **Intuit QuickBooks**
- **ESB**
- **Wipro DICE ID**

ADDITIONAL ADVANTAGES

- Lifetime LMS access
- Recorded lectures
- Unlimited mocks & GDs
- Performance based stipend
- 1:1 counselling
- Access to hiring partners

PROGRAM AT A GLANCE

DURATION
6 months · weekend & weekday tracks

MODE
Live online + recorded LMS + labs

ELIGIBILITY
B.E / B.Tech / Diploma · Mech, EEE, ECE, Auto

ASSESSMENT
Module quizzes, 6 graded projects, final viva

COHORT SIZE
Capped for 1:1 mentor attention

SUPPORT
Placement assistance until you are hired

ACCREDITED CERTIFICATIONS.

Every learner receives industry-recognised, accredited certificates on completion of the internship, industrial training and capstone project modules.



INTERNSHIP CERTIFICATE
Accredited Certification



INDUSTRIAL TRAINING
Accredited Certification



PROJECT COMPLETION
Accredited Certification

INTERNSHIP

Verified internship completion credential

TRAINING

Industrial training hours certified

PROJECT

Capstone project completion proof

GLOBAL MNC CERTIFICATIONS.

Learners are prepared for and certified through globally recognised professional certification programs from leading technology companies.



CISCO
Cybersecurity CCST



MICROSOFT
Azure Fundamentals



IBM
Internet of Things



AUTODESK
Certified User



ESB
Entrepreneurship

AUTHORISED PARTNERS.

Edufyi Tech Solutions is an authorised certification and testing partner for the world's leading technology certification bodies.

ADOBE

MICROSOFT

QUICKBOOKS

AUTODESK

CISCO

ESB

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- Cisco Cybersecurity CCST
- IBM Internet of Things
- Adobe Certified Professional
- Autodesk Certified User
- ESB Entrepreneurship
- QuickBooks Certified User

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