



RCETEEAC05– ELECTRIC VEHICLE CHARGING SYSTEMS

Course outcomes:

The students will be able to:

- Measure the Voltage, Current and temperature of individual cell array
- Estimate the fault current during short circuit and overload
- Develop the galvanizing isolation for high and low side MOSFET
- Estimation of SOC and SOH
- Develop protection circuit for fast charging
- Mitigation of harmonics in EV charging system
- understand the origins of the discontinuous conduction mode and be able to solve converters operating in DCM
- Add a motor and motor control circuit into a microprocessor-based development kit

Syllabus:

UNIT I Future of Mobility – Electric Vehicles, batteries, EVs Made up of - Charging & Discharging Infrastructure - EV & the power systems, Industry Perspective on Applications of Electrification - Electrification Impacts – Vehicle Automation – The Basic Technologies – Automation – The Impacts

UNIT II Battery Boot Camp - How lithium-ion cells work - BMS sensing and high-voltage control - BMS design requirements - SOC estimator - Linear Kalman filter as a state estimator – SOH estimator.

UNIT III AC Motor Control Components - Power Semiconductor Switches - Power MOSFETs, MOSFET Gate Drivers, BJTs and IGBTs, More About Switching Loss, Wide Bandgap Power Semiconductors.