Final Year Projects for EEE Students PDF

A strong EEE final year project works on a real power or control problem, runs safely at low voltage in the lab, and produces measured results such as efficiency, power factor or response time. Good areas in 2026 are solar and battery systems, EV charging and motor drives, power quality, smart metering and protection. Choose one your team can build, test and explain within your project time.

Key takeaways

- Work at safe, low voltages for prototypes. Use isolation, fuses and your guide's approval before connecting anything to mains.
- Each project lists components, modules, steps, viva points and a rough cost.
- All costs are approximate and vary by city and vendor. Power parts such as batteries and panels change price often.
- Simulate in MATLAB/Simulink, PSIM or LTspice first, then build a scaled hardware model.
- Add data logging and a dashboard. Measured data and clear graphs lift your report and viva.

How to choose your EEE final year project

1. **Simulation, hardware or both?** Many departments accept a Simulink-only project for topics like grid stability. A hardware prototype is usually valued more.
2. **Safety and lab support.** Check which supplies, isolation transformers and instruments your lab has.
3. **Clear output numbers.** Efficiency, total harmonic distortion (THD), voltage regulation and response time are easy to measure and compare.
4. **Career direction.** Core roles value power electronics and protection. Software and data roles value the monitoring, data and analytics layer.

Beginner-level final year projects

1. Solar charge controller with MPPT

- **Problem:** Simple chargers waste solar power when light changes.
- **Components:** small solar panel (20 to 50 W), buck converter, MOSFET, Arduino or STM32, voltage and current sensors, 12 V battery.
- **Modules:** sensing, perturb and observe MPPT, PWM control, battery protection.
- **Steps:** simulate the buck converter, build it, run P&O, compare energy harvested with and without MPPT.
- **Viva points:** P-V curve, MPPT algorithms, buck duty cycle, battery charging stages.

- **Approximate cost:** Rs 3,500 to 7,000 (varies by city and vendor).

2. Prepaid smart energy meter

- **Components:** energy metering IC or current sensor, ESP32, relay, keypad or app.
- **Modules:** energy measurement, balance tracking, disconnect at zero balance, recharge.
- **Viva points:** active and reactive power, metering accuracy, relay rating.
- **Approximate cost:** Rs 2,000 to 4,000 (varies by city and vendor).

3. Automatic power factor correction

- **Components:** zero-crossing detectors, capacitor bank, relays, microcontroller, inductive load (small motor or choke).
- **Modules:** phase angle measurement, power factor calculation, capacitor switching.
- **Viva points:** why low power factor costs money, capacitor sizing, over-correction risk.
- **Approximate cost:** Rs 3,000 to 6,000 (varies by city and vendor).

4. Transformer health monitoring with IoT

- **Components:** temperature sensors, current sensor, oil level float switch (model), ESP32, dashboard.
- **Modules:** sensing, threshold alarms, trend logging.
- **Viva points:** transformer losses, hotspot temperature, why trends matter more than single readings.
- **Approximate cost:** Rs 2,000 to 4,500 (varies by city and vendor).

Intermediate-level final year projects

5. BLDC motor speed control for an e-bike model

- **Components:** BLDC motor with hall sensors, three-phase inverter or ESC, STM32 or Arduino, throttle.
- **Modules:** hall sensor commutation, PWM speed control, current limit.
- **Viva points:** six-step commutation, back EMF, why BLDC suits EVs.
- **Approximate cost:** Rs 5,000 to 10,000 (varies by city and vendor).

6. Battery management system for a Li-ion pack

- **Components:** 3S or 4S Li-ion cells, cell monitoring IC or voltage dividers, balancing resistors, MOSFETs, microcontroller.
- **Modules:** cell voltage sensing, balancing, over-current cut-off, state-of-charge estimate.
- **Steps:** start with a small pack, log charge and discharge, compare coulomb counting with voltage-based SoC.
- **Viva points:** passive versus active balancing, SoC estimation, thermal safety.
- **Approximate cost:** Rs 3,000 to 6,500 (varies by city and vendor).

7. Wireless power transfer for low-power devices

- **Components:** copper coils, high-frequency oscillator, MOSFET driver, rectifier, LED or phone load.
- **Modules:** resonant transmitter, receiver, efficiency against distance tests.

- **Viva points:** resonant inductive coupling, coil alignment, efficiency drop with gap.
- **Approximate cost:** Rs 1,500 to 3,500 (varies by city and vendor).

8. Three-phase fault detection and protection model

- **Components:** low-voltage three-phase model supply, current transformers, relays, microcontroller, GSM module.
- **Modules:** over-current, phase loss and earth fault sensing, trip and alert.
- **Viva points:** relay coordination, CT ratio, types of faults.
- **Approximate cost:** Rs 4,000 to 8,000 (varies by city and vendor).

9. Power quality analyser

- **Components:** voltage and current sensing, microcontroller or DAQ, Python on a laptop.
- **Modules:** sampling, FFT, THD calculation, sag and swell detection, reports.
- **Viva points:** harmonics sources, THD, sampling theorem.
- **Approximate cost:** Rs 2,500 to 5,000 (varies by city and vendor).

Advanced-level final year projects

10. Bidirectional EV charger (scaled model)

- **Components:** bidirectional DC-DC converter, battery, controller, sensors.
- **Modules:** charge mode, discharge (vehicle-to-load) mode, mode switching logic.
- **Viva points:** buck-boost operation, control loop design, efficiency at different loads.
- **Approximate cost:** Rs 6,000 to 12,000 (varies by city and vendor).

11. Grid-tied inverter simulation with hardware-in-loop demo

- **Software:** MATLAB/Simulink.
- **Hardware:** small single-phase inverter driven by a microcontroller with SPWM.
- **Modules:** SPWM generation, PLL synchronisation, LC filter, THD study.
- **Viva points:** anti-islanding, PLL, filter design.
- **Approximate cost:** Rs 3,000 to 8,000 for the hardware part (varies by city and vendor).

12. Vector control (FOC) of an induction motor in simulation

- **Software:** MATLAB/Simulink or PLECS.
- **Modules:** Clarke and Park transforms, PI controllers, speed response tests.
- **Viva points:** FOC versus V/f control, tuning PI gains, torque ripple.
- **Approximate cost:** Rs 0 to 1,000 if you use the college licence (varies by city and vendor).

13. Microgrid energy management with solar, battery and load

- **Components:** solar panel, battery, two or three switchable loads, controller, dashboard.
- **Modules:** source priority logic, load shedding, daily energy reports.
- **Viva points:** energy balance, battery depth of discharge, priority rules.
- **Approximate cost:** Rs 6,000 to 12,000 (varies by city and vendor).

14. Load forecasting using machine learning

- **Software:** Python, pandas, scikit-learn; public load data from a utility or open dataset.

- **Modules:** data cleaning, features (hour, day, temperature), model training, error analysis.
- **Viva points:** MAPE, train-test split by time, why weather affects load.
- **Approximate cost:** close to Rs 0 using free tools (varies by city and vendor if you buy hardware).

15. Smart street lighting with power saving analysis

- **Components:** LED drivers, PIR and LDR sensors, ESP32 nodes, energy logging.
- **Modules:** dimming, motion boost, energy comparison against fixed timing.
- **Viva points:** LED driver design, PWM dimming, energy saved over a test week.
- **Approximate cost:** Rs 2,500 to 5,000 (varies by city and vendor).

Project report structure

1. Title page, certificate, declaration, acknowledgement
2. Abstract
3. Introduction: problem, objectives, scope
4. Literature survey with 8 to 15 references
5. System design: block diagram, circuit, ratings and design calculations
6. Simulation results
7. Hardware implementation: photos, test set-up, safety measures
8. Results: tables, graphs, comparison with simulation
9. Conclusion and future scope
10. References

The project report title page generator can help with the cover page.

Common mistakes to avoid

- **Working at mains voltage without supervision.** Use low-voltage models and isolation.
- **No design calculations.** Show how you sized the inductor, capacitor, MOSFET and heat sink.
- **Simulation and hardware that never meet.** Compare both and explain the gap.
- **No efficiency data.** Measure input and output power at several loads.
- **Last-minute PCB.** Order or etch boards early; delays are common.

From EEE project to career

Your project can support core roles in power, EV and renewables, and also data roles. Load forecasting, power quality analysis and smart metering all produce data that needs cleaning, analysis and dashboards. If you plan to switch to IT, the data and analytics layer of your project is a strong talking point. Compare options in the best courses after B.Tech PDF.

Frequently asked questions

Which are the best final year projects for EEE students?

Solar MPPT chargers, battery management systems, BLDC motor control, power factor correction and smart metering are all good choices. Pick one you can build safely and measure clearly.

How much does an EEE final year project cost?

Most projects here cost between about Rs 2,000 and Rs 12,000. Simulation-only projects cost very little. All costs are approximate and vary by city and vendor.

Is a MATLAB simulation project acceptable for EEE?

Many departments accept it, especially for control and grid topics. Check with your guide. A small hardware demo alongside the simulation usually helps in the viva.

How do I keep my EEE project safe?

Work at low voltage, use isolation transformers, fuses and proper enclosures, and get your guide's approval before connecting to mains.

What do examiners ask in an EEE project viva?

Expect questions on your design calculations, component ratings, control method, efficiency results and how simulation results compare with hardware.

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Sources and further reading

- MathWorks Simulink documentation
- Ministry of New and Renewable Energy, Government of India
- Bureau of Energy Efficiency
- Arduino documentation

About this PDF

Prepared by the Uncodemy trainer team as a practical project guide. Component lists and costs are approximate and change often. Corrections: info@uncodemy.com.

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