

Project Selection Details

EN2160 - Electronic Design Realization



Team Members:

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1. List at least three engineering principles you learned during last three semester relevant for your project.

- a) Microcontroller programming
- b) Circuit analysis and design
- c) Signal processing techniques.

2. Briefly explain the way you would apply engineering principles to your project.

- Microcontroller programming principles would be utilized to develop algorithms for managing battery charging, discharging, and balancing processes effectively.
- Circuit analysis and design principles would be applied to design the hardware components of the battery management system, ensuring efficient voltage measurement and balancing circuits.
- Signal processing techniques would be employed to filter and analyze the voltage data obtained from the cells, enabling accurate monitoring and control of the battery system.

3. List at least four issues where Mathematics and Science you learned during last three semester can be applied for your project.

- a) Calculus and differential equations for modeling battery behavior and dynamics.
- b) Physics principles, such as Ohm's Law, to understand the underlying principles governing battery operation.
- c) Probability and statistics for analyzing data variability and predicting battery performance.
- d) Linear algebra for matrix calculations involved in signal processing and control algorithms.

4. Briefly explain the way you would apply mathematics and science to your project.

- Utilizing calculus and differential equations to develop mathematical models of battery behavior for simulation and control.
- Applying physics principles to design and optimize the battery management system for efficiency and safety.
- Employing probability and statistics to assess the reliability and performance of the battery system.
- Utilizing linear algebra for signal processing and control algorithm implementation.

5) What are the hands-on skills you have for making this project a real success.

PCB design and fabrication
Programming skills for microcontroller-based systems
Circuit prototyping and testing
Data analysis and interpretation
Troubleshooting

6) Explain the applicability of your project for solving an industrial problem in Sri Lanka.

Enhancing the performance and lifespan of battery packs used in various industrial applications.
Contributing to the development of sustainable energy infrastructure in Sri Lanka by optimizing
battery usage and extending their operational life.

7) List the cost of main items needed for your project.

- a) Electronic Components – LKR 30000
- b) Batteries – LKR 10000
- c) PCB – LKR 15000
- d) Enclosure – LKR 10000

6) Briefly explain the suitability of your project to achieve the learning outcomes of the EDR course.

- The project involves applying theoretical knowledge in engineering principles, mathematics, and science to a practical problem.
- It requires hands-on skills in designing, prototyping, and testing electronic systems.
- The project addresses real-world challenges and fosters innovation and problem-solving abilities.
- It promotes interdisciplinary collaboration and the integration of various engineering concepts to develop a functional solution.