Kingston University London

EG5016B – Exploring Engineering Project Management

BEng/MEng Mechanical Engineering
BEng/MEng Mechanical Engineering (Automotive)
BEng/MEng Electrical and Electronics Engineering

INDUSTRY LIVE BRIEF

1. Organisation / Contact Details

- Organisation name : Jaguar Land Rover
- Your name : Aditi Rahegaonkar
- Job Title / Role : CAD & AVA Engineer
- Email Address : arahegao@jaguarlandrover.com
- **LinkedIn Profile (optional)** : (4) Aditi Rahegaonkar | LinkedIn

2. Title of the Challenge

A short, clear title (e.g. "Redesigning a Modular Bike for Urban Use")

Designing a Modular Cooling System for Electric Vehicle Battery Packs

3. Summary of the Brief

A short description (250 – 300 words) of the real-world engineering problem you would like the students to work on.

This project challenges students to design a modular cooling system for electric vehicle (EV) battery packs that can be adapted to different vehicle platforms. The system should maintain optimal battery temperature during operation and charging, while being easy to manufacture and scale.

Students will explore current EV battery cooling methods (air, liquid, phase-change materials), identify limitations, and propose a modular design that can be integrated into various vehicle architectures. The focus will be on mechanical layout, thermal management principles, and manufacturability. CAD modeling will be used to visualize the concept, with scope for future FEA and thermal simulation.

4. Background or Motivation

What is the industry context or reason behind this challenge?

Battery thermal management is critical for EV performance, safety, and longevity. As manufacturers aim to scale EV production across different models, modular and flexible cooling solutions are increasingly valuable. This brief introduces students to a real-world challenge in EV design and encourages them to think about thermal systems, packaging constraints, and platform scalability.

5. Constraints/Special Considerations

Any key requirements such as sustainability, manufacturing, cost, regulations, or customer needs?

- Must be modular and adaptable to different battery sizes and layouts.
- Consider manufacturability, cost, and sustainability.
- Avoid complex electronics—focus on mechanical and thermal design.
- Suitable for group development over 8 weeks with CAD tools.

6. Presentation and Acknowledgement

Do you consent for the student work on this brief to be presented at our Future Skills Day (December 2025) or shared internally within the University (with appropriate credit to you/your organisation)?

☒Yes
☐Yes, but internal use only
☐No

7. Are you planning to attend the Future Skills Day on the 10th of December between 10am – 2pm at the Townhouse, Penrhyn Road Campus, Kingston University London?

☐Yes
☒Maybe
☐No

References and Supporting Research:

1. Battery Cooling Systems for Electric Vehicles – A Review
https://www.sciencedirect.com/science/article/pii/S2352484722000956

2. Thermal Management of EV Batteries – NREL
https://www.nrel.gov/transportation/thermal-management.html

3. Modular Battery Pack Design – AVL
https://www.avl.com/-/modular-battery-pack-design

4. Liquid Cooling for EV Batteries – Dana Thermal Products
https://www.dana.com/products/thermal-management/liquid-cooling-solutions/

5. Phase Change Materials for Battery Cooling – MDPI Energies
https://www.mdpi.com/1996-1073/13/18/4764