

ECOCAR

INNOVATION CHALLENGE

DRIVING THE FUTURE

Vehicle Systems Engineering Lead

About the Competition: The EcoCAR Innovation Challenge is a four-year collegiate engineering competition in which university teams develop intelligent and energy-efficient vehicle technologies using advanced controls, electrified propulsion, automation, artificial intelligence, and industry-standard development processes.

Mississippi State University will compete in the General Motors track using a 2026 Chevrolet Blazer SS Police Edition EV. Students will contribute to the design, integration, and validation of advanced propulsion, electrical, controls, and autonomous vehicle systems.

Overview: The **Vehicle Systems Engineering Lead** is an undergraduate worker position supporting the MSU EcoCAR Innovation Challenge team. The Vehicle Systems Engineering Lead will work under the direction of the Controls Manager, Integration Manager, and MSU EcoCAR faculty advisors.

The role's responsibilities will evolve throughout the competition cycle. The primary areas of focus are expected to include:

- **Year 1:** Controls development and vehicle architecture evaluation
- **Year 2:** Electrical system planning and integration
- **Years 3–4:** Autonomous systems development and validation

The position's technical focus will evolve throughout the competition. Candidates who are prepared to support the changing responsibilities across multiple years are preferred; however, strong applicants who are available for only a specific phase or academic year are still encouraged to apply. Continued appointment will depend on the student's availability and willingness to support the responsibilities assigned for each competition year.

Hours: 20 hours/week, greater availability while approaching deliverable deadlines and during travel expected

Benefits:

- Hourly pay
- Leadership and project-management experience within a multidisciplinary engineering team
- Professional experience that can strengthen résumés and future employment opportunities
- Access to EcoCAR-exclusive career fairs and recruiting events
- Mentoring by industry experts
- Extensive training provided by the competition

- Opportunities to travel to workshops and competitions
- Practical experience in:
 - Controls development
 - Electrical system integration
 - Technical documentation
 - Engineering requirements development

Desired Skills and Qualifications:

Experience in the following areas is preferred but not required:

- Prior EcoCAR, student design team, or project leadership experience
- MATLAB and Simulink, C, C++, or CAPL Programming
- Software development life cycle practices
- Version control using GitHub or GitLab
- Continuous integration and continuous deployment practices
- Feedback control and rule-based control
- Leadership and team coordination
- Data processing, analysis, and evaluation
- Technical writing
- AI/ML development
- Software development
- CAN communication protocols
- dSPACE software and hardware-in-the-loop testing

Requirements:

- Must intend to remain enrolled at Mississippi State University through at least May 2027
- Must be majoring in Electrical Engineering, Computer Engineering, Computer Science, Mechanical Engineering, or a related field

Job Description:

General responsibilities

- Report to the Controls Manager and Integration Manager
- Coordinate with the Controls and Integration subteams
- Lead the planning and execution of subteam activities
- Track deliverable progress and manage deadlines
- Organize subteam meetings and team-building activities
- Lead or contribute to technical papers, reports, and presentations

Year 1: Controls and Architecture Evaluation

- Validate vehicle designs through simulation to support vehicle architecture selection
- Collaborate with appropriate engineering leads to develop decision matrices and evaluation processes for the rear motor and motor controller
- Support the development and documentation of controls models and processes

Year 2: Electrical Planning and Integration

- Create technical schematics documenting both original equipment manufacturer wiring and MSU-added wiring
- Design electrical schematics for power distribution and signal routing to team-added sensors and equipment

- Work with the Integration Manager to perform electrical integration activities as required
- Support wire sizing, circuit protection, harness routing, and electrical system documentation

Years 3–4: Autonomy Development and Validation

- Develop and validate constraints and requirements for autonomous vehicle testing
- Work with the Controls and Autonomy Managers to validate software using hardware-in-the-loop testing
- Support longitudinal and lateral autonomous feature development
- Assist with vehicle-level autonomy testing, data evaluation, and validation

Interested candidates should apply soon [here](#) to allow onboarding with the start of the semester. If you have any questions, please send an email to jeball@ece.msstate.edu.