View results

Respondent

9 Adi Nikumbh

43:11
Time to complete

1. Date of this semester progress report submission *

12/6/2025

2. Name of project exactly as it was listed in your award letter *

Illini Electric Motorsports

3. Date of original award letter *

Fall 2024

4. Date of expiration listed on award letter (or on scope change approval if more recent) *

Fall 2026

5. How much was your award (i.e., original award plus any approved budget increases)? *

$107,724.87

6. How much of your award has been spent to date (in dollars)? *

44000

7. Date of forecasted project completion *

6/17/2026

8. Have you submitted one or more semester progress reports previously? *

- ( ) YES
- (•) NO

9. Describe, in detail, what has been completed on the project since the last semester progress report (or since the project commenced if you have not yet submitted a semester progress report)? *

Since the project commenced, Illini Electric Motorsports (IEM) has made significant progress toward developing a cutting-edge, high-performance fully electric vehicle. We successfully designed, manufactured, and assembled a completely functional car and traveled to the Michigan 2025 competition to compete. This vehicle represented the second fully electric car developed by IEM, embodying the team's commitment to sustainability and serving as a tool to develop the next generation of engineers.

The team achieved several impressive operational and design milestones during the initial phase. We successfully had a driving car a full month earlier than the previous year, demonstrating accelerated development capabilities. Design features included our lightest chassis to date and a successful initial powertrain system consisting of a 600V in-house manufactured battery, and an inverter system paired with a motors at each corner. Furthermore, we successfully implemented a full Hardware-in-the-Loop (HIL) system, which allowed for robust off-car validation of electronics, software, and powertrain stability, utilizing all low-voltage electronics, vehicle controllers, inverters, and a motor.

Building on these successes, our current development efforts for the 2025-2026 vehicle, the second phase of the project, focus on optimizing powertrain performance and enhancing manufacturability to ensure we hit the track at Michigan 2026. A major project is the development of an all-new 600V in-house battery utilizing 12Ah Melasta pouch cells, which will be characterized using high-fidelity EIS and HPPC testing. Concurrently to battery work, the mechanical team is designing and manufacturing a new 11.6:1 planetary gearbox to incorporate a more efficient gear ratio. This new design will be precision EDM machined by our sponsor partners, and will more efficiently translate the power from our motors to the wheels, significantly boosting the vehicle's dynamic performance. We are also committed to elevating our data acquisition and testing pipeline by planning the integration of new sensors, loggers, and displays, which will provide the precision and reliability needed to validate our new systems and strengthen our track performance.

10. Describe, in detail, the project's challenges/obstacles since your last semester progress report (or since the project commenced if you have not yet submitted a semester progress report)? *

Since the project commenced, the primary obstacle was a critical failure at the Michigan 2025 competition, where the car suffered water ingress in the High Voltage electrical system, preventing participation in dynamic events. The experience demonstrated the need for a more robust and extensive testing period to validate the vehicle's designs, particularly in adverse conditions, and to gather helpful data for future designs.

11. Describe, in detail, the project's successes since your last semester progress report (or since the project commenced if you have not yet submitted a semester progress report)? *

Since the project commenced, Illini Electric Motorsports (IEM) achieved significant milestones with the development of its first car. We successfully designed, manufactured, and assembled a completely functional vehicle that allowed the team to travel and compete at the Michigan 2025 competition. The team accelerated its timeline, achieving a driving car a full month earlier than the previous year. We also implemented a full Hardware-in-the-Loop (HIL) system for robust off-car validation of electronics and software, and achieved our lightest chassis to date.

12. Did your project have any changes to its team that SSC should know about (e.g., project lead, faculty/staff advisor, departmental financial contact)? *

NOTE: If yes, please complete the SSC Project Contact Information Change Form located at this link: https://forms.office.com/r/uBjx9nmNpG

- ○ YES
- ◉ NO

13. Complete and upload the semester financial documentation for your project. You should reflect all expenditures since your last semester project report. We strongly suggest that you also upload supporting financial documentation from Banner for your award CFOP. NOTE: When your project is completed and/or expired (whichever comes first), any remaining project funds will be transferred back to the SSC.

https://studentengagement.illinois.edu/sites/default/files/2024-09/SSC-Budget-Timeline-SEMESTER-PROGRESS-REPORT-template.xlsx
*

SSC-Budget-Timeline-SEMESTER-PROGRESS-REPORT-_Adi Nikumbh.pdf

14. (OPTIONAL FOR SEMESTER REPORT) Upload project marketing and/or media not previously submitted in semester progress reports.

NOTE: Project marketing and/or media must include SSC's logo and/or a statement of which fee(s) funded the project.