Project 4 (Team) Deliverables

Description: Combine lateral and longitudinal models into a single EV model with the goal of running the vehicle around the race track as fast as possible to cover maximum distance in one hour without leaving the track.

Project Timeline	Due Date
Week 1 – Weekly Progress	4 Apr 2026, 11:59 PM
Week 2 – Weekly Progress	11 Apr 2026, 11:59 PM
Week 3 – Project Submission	18 Apr 2026, 11:59 PM

REQUIREMENTS

1. You will start with a battery that is at 80% SOC.
2. You have the option of a 1 speed, 2 speed, or 3 speed gear box for the transmission.
    a. Assume that you can shift gears instantaneously.
    b. Assume that the gear inertias are negligible.
    c. Cannot have two consecutive shifts within 2 seconds
3. Total time of 60 minutes
4. Metric: How many laps (including fractions) has your EV completed while satisfying the following constraints:
    a. You cannot leave the track.
    b. Your SOC cannot drop below 10% and go over 95%
    c. You must have 100% friction braking when vehicle speed is less than 5 mph. This minimum required friction braking percentage drops LINEARLY to 5%

at 25 mph and remains there beyond that speed.

5. Each team will prepare a ~10 minute presentation/ demo over their model. The presentation will happen after final submission week

WEEK 1:

- Your EV model should go at least one lap around the track. You may or may not use a multi-speed gear box. You must have a battery electric vehicle drive train working in conjunction with the lateral dynamics (combination of both lateral and longitudinal dynamics).
- At least 1 lap.

WEEK 2:

- Vehicle should go at least 5 laps, as fast as possible while following the Project requirements.

WEEK 3:

- Continue on making your EV go around the track as fast as possible while following the Project requirements.
- Assume a friction coefficient of 0.5