Project goal and requirements
ELEC391 Electrical Engineering Design Studio II

1. **Goal**

   Design and fabricate a self-balancing robot on two wheels that is able to maintain balance in a vertical position while being driven by an external operator on a course track that may present sloped portions.

2. **Requirements**
   2.1. The robot must be able to balance itself on a flat surface in the vertical position by actuating the two DC motors.
   2.2. The robot must be able to maintain balance while driven by an external operator on a flat surface at a reasonable speed.
   2.3. The robot must be able to maintain balance while taking turns on a flat surface at a reasonable speed.
   2.4. The robot must be able to move forward and backward under external control.
   2.5. The robot must be controlled externally through wireless (Bluetooth) signaling. Four controls (forward, backward, turn left, turn right) must be implemented.
   2.6. The maximum angle of the track on which the robot must maintain balance is 10 degrees (positive and negative).
   2.7. Additional requirements: to be defined by each team at the time of prototype demo (must not nullify or contradict any of the above requirements).

3. **Constraints**
   3.1. All teams must use the components kit provided as part of course materials.
   3.2. Self-proposed (extra) features must fit in a budget of $65, orderable from Digikey. Any components and parts from the 2nd year project course kit(s) can be used without counting towards the $65.
   3.3. Power source is limited to the battery pack provided in the kit.
   3.4. Additional constraints: to be defined by each team at the time of prototype demo (must not nullify or contradict any of the above constraints).