The Challenge:  The challenge will be to create a remote-controlled mobile robot to collect tennis balls from a field and place them into a box. There are two locations of importance within the field: the “start”, and the box. All competitors will begin the competition at the “start” area (one competitor at a time). The robot will need to search the field for tennis balls. The robot must collect the tennis ball(s) and place it/them into the “box”. The robot to finish collecting and placing the largest number of tennis balls into the box, or finish the task in the shortest amount of time will be the winner. Robots will be given a maximum of 3 minutes to accomplish the task.

The Robot:  Each robot should have an identifiable name tag (2”x 6”) attached to it. The Vex Robotics Design System kit and/or other components may be used to construct your robot. The size, height, locomotion style, and ball-collecting mechanism of the robot are not limited. However, limited numbers of components in the kits are available to the team, and teams are sharing common resource.

The Field:  The field is a rectangular area with dimension 6’x12’. The field is surrounded by connected wooden shelves which are 8” tall. The floor is the regular lab floor. The layout of the field is shown in the following diagram. The “start” is a 1’x 1’ flat area where the robot will begin the competition. The “box” is 1’ (L) x 1’ (W) x 1’ (H) where the robot can place the tennis balls from the top open square area. The wall of the box is made of cardboard. The tennis balls will be scattered randomly in the field.

Deliverables:
1. **Tennis Ball collecting Robot**  
   Each team should build a tennis ball collecting robot. Each team has 3 minutes to demo the ball-collecting capability of their remote-controlled robot.

2. **PowerPoint Presentation**  
   Each team should give a 5-minute PowerPoint presentation about their robots. (Template will be available at class website.)

3. **Engineering Notebook**  
   Document the lessons your team has learned in the construction process. The contents should include (1) title, (2) status/progress, (3) lessons learned, and issues/problems. Engineering Notebook is a working online blog that records your brain storming, design revisions, construction processes, issue resolving and testing process.

4. **Project Report**  
   A project report should document the strategic planning, high-level design, task assignment, risk management, and innovative ideas. List the reference materials and major components. Illustrate the structural, power transmission, and electrical design of robots. Explain how the robot meet the functional and performance requirements. (Template will be available at class website.)

Deadline:  **Presentation** 12/04/2012 (Tuesday)  **Competition** 12/06/2012 (Thursday).