

# ME 446 Robot Dynamics and Control

## Project Description

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# Objectives

- Implement various types of control approaches learned in class to finish given tasks using the robot arm.
- Learn how to select a suitable control approach for a given task.
- Promote active engagement of students to solve challenging engineering problems.



# Tasks

## Task 1: Peg in a hole

- Force Control

## Task 2: Obstacle

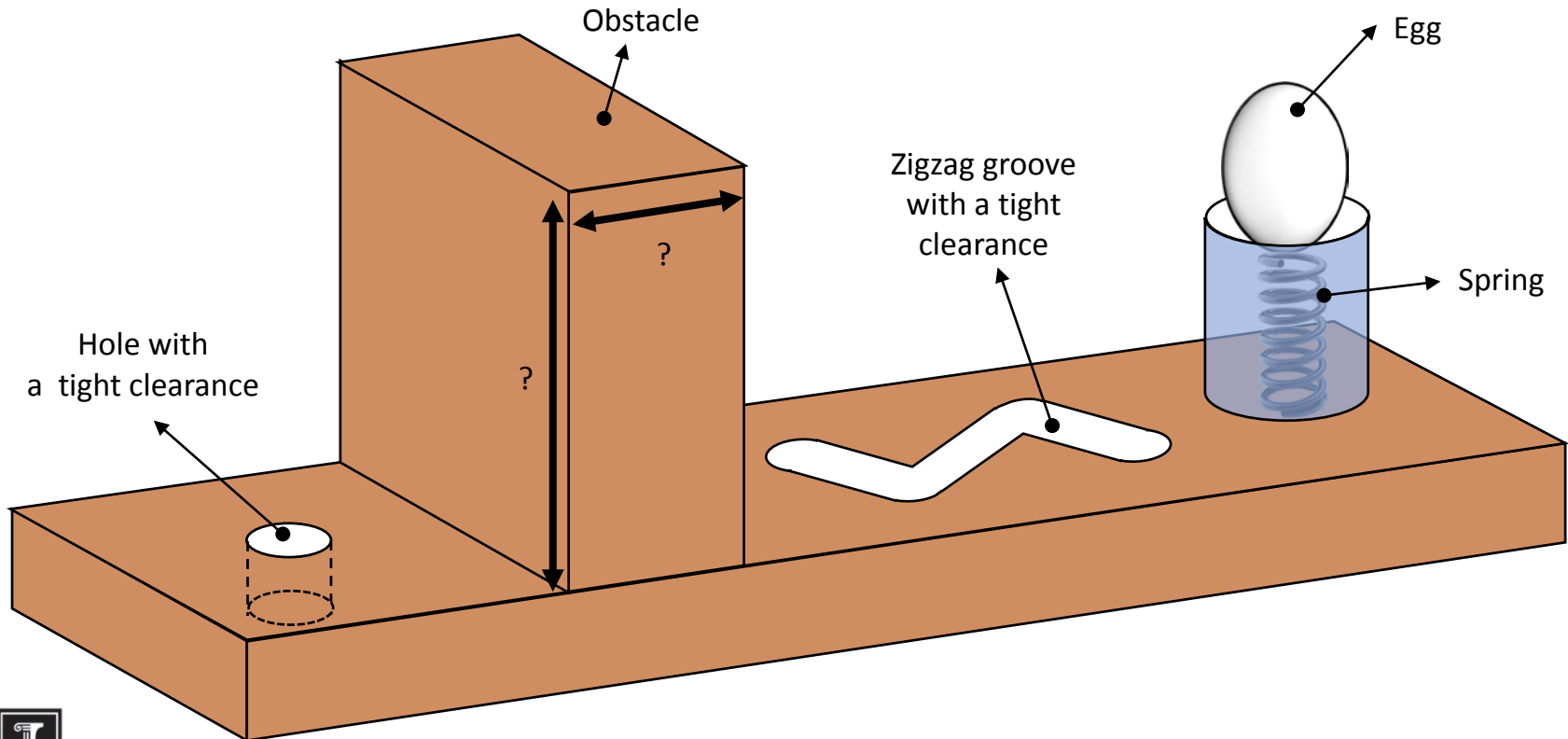
- Path planning
- Position Control

## Task 3: Zigzag groove

- Path Planning
- Force Control

## Task 4: Egg

- Force Control



# Task 1: Peg in a hole

- Insert the peg attached to the robot's end effector in a hole that has tight clearances.
- The peg has to touch the bottom of the hole to get a score. The switch installed at the bottom of the hole will detect a touch.



# Task 2: Obstacle

- The robot's end-effector has to reach the desired goal position without colliding with the obstacle in order to get a score.
- Safe path planning and precise motion control will be required to avoid the obstacle and complete the task.



# Task 3: Zigzag Groove

- The peg on the end-effector has to pass through the narrow zigzag groove.
- Path planning and directional force control will be required.
- The dimension of the zigzag will be provided beforehand.



# Task 4: Egg Push

- Push the egg without cracking it and touch the edge of the egg holder.
- A spring will be located underneath of the egg. The robot should push the egg with the right amount of force in order to finish the job without breaking the egg.
- The stiffness of the spring will be provided beforehand.



# Report / Web Page

- Your group report for this contest is to put together a small webpage explaining how you solved the contest tasks. The web page should have 3 of 4 paragraphs that explain what control techniques your group used to accomplish the tasks along with a video of your controller in action. In addition you should include the names of the group members along with a group picture. Also zip your entire source code project and add a link to this zip file. Finally create links to your 4 lab reports for Lab 1 through Lab 4.

