Lecture 1, Sep 3, 2025

- The 5 basic problems of robotics:
  1. Forward kinematics: find the pose of the end effector given joint states
  2. Inverse kinematics: given a desired end effector pose, find the joint states
     - Solution is often not unique (underdetermined problem)
  3. Dynamics: Derive a mathematical model for simulation and control design
     - We will arrive at a canonical model
  4. Motion planning: given a target pose, plan a path for the end effector (joint states as a function of time) so that it reaches the goal while avoiding collisions
  5. Control: design feedback controllers to execute the planned motions (reference signals) with accuracy, speed and robustness