# ROB550 Final Exam Topic List

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## Armlab

* + manipulator configurations
  + homogeneous coordinates
  + transformation matrices
  + camera projective transforms
  + affine transformations
  + forward kinematics
  + D-H convention & frame assignment
  + inverse kinematics
  + cubic spline & trajectory generation
  + Tool tip Jacobians and Jacobians as generalized gear ratios
  + finite state machines

## Balancebot

* + motor control, PWM, H-bridges
  + sensor filtering: linear, non-linear, and Kalman
  + Sensor fusion
  + PID control
  + cascade control
  + odometry & dead reckoning; odometry error correction
  + potential fields & navigation functions concepts

## Botlab

* + Monte-Carlo localization concepts
  + particle filter concepts
  + SLAM concepts
  + Range sensor error models
  + A\* path planning concepts
  + RRT and its strengths and weaknesses