Syllabus
ROB 542: Actuator Dynamics (4 credits)

COURSE DESCRIPTION
Robots and automated systems move using many different methods of actuation, including electric motors, hydraulic systems, and pneumatic systems. While the motions of the robot are largely controlled through software, the physical system can impose significant constraints. These constraints are not only speed or force limits; all physical systems have passive dynamics, such as inertia or compliance. Passive dynamics can either limit the performance, or enhance it. This course covers various actuation methods, and how to utilize passive dynamics for a specific task. Examples include robotic manipulation tasks, robot-human interaction, CNC Machines, or legged locomotion.

PREREQUISITES
Graduate Standing, and prior courses on dynamics and control (at the discretion of the instructor) such as ME535, ME531, ME533

Instructor
Prof. Jonathan Hurst
Dearborn 218A
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Class meetings
Section 001 CRN 21006 Location: Graf 302 Tues/Thur, 10:00–11:50 AM

This course combines approximately 12 hours per week of lecture and project time, inside and outside of class.

Textbooks
None

Electronic file Access
Course documents will be distributed via Google Drive. Grades will be posted on Canvas.

Course learning OUTCOMES
1. Describe the operation and dynamic model of actuation methods, including brush and brushless electric motors, hydraulics, and pneumatics.
2. Calculate the physical performance limits of an actuator for a particular task.
3. Create or simulate an actuator, and experiment at the limits of its performance.

Other things we’ll discuss:
1. Software control in cooperation with passive dynamics; strategies

Grading:
Intermediate goals (Assignments 1-2, 4-6): 10%
Assignment 3, 7: 15%
Actuator Presentation: 10%
Paper Review Discussion Lead: 10%

Lab Policies
● Follow the Reasonable Person Principle

Statement Regarding Students with Disabilities
Oregon State University is committed to student success; however, we do not require students to use accommodations nor will we provide them unless they are requested by the student. The student, as a legal adult, is responsible to request appropriate accommodations. The student must take the lead in applying to Disability Access Services (DAS) and submit requests for accommodations each term through DAS Online. OSU students apply to DAS and request accommodations at our Getting Started with DAS page.

Link to Student Conduct Code: http://studentlife.oregonstate.edu/studentconduct/offenses-0