

ME 530.676, System Identification

Course Description

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Welcome to ME 530.676, *Locomotion in Mechanical and Biological Systems*. Advanced graduate course on the mechanics of locomotion in animals and machines, and neural control of locomotion. Terrestrial locomotion will be emphasized. Topics include dynamical systems theory, linear and nonlinear differential equations, Poincaré and Floquet theory, Lagrangian dynamics, nonholonomic constraints, and hybrid mechanical systems.

- Course details:
 - Class Time: MTW, 1-2:30
 - Room: Hodson Hall 303
 - Office Hours: By Appointment.
 - Recommended Course Background: graduate course in robotics or dynamical systems theory.
- Required Textbooks:
 - Khalil, 3rd edition [1], chapters 1-2 (see course website).
 - Guckenheimer and Holmes [2], chapter 1 (see course website).
 - Murray, Li, and Sastry [3], freely available online:
<http://www.cds.caltech.edu/~murray/books/MLS/pdf/mls94-complete.pdf>

References

- [1] H. K. Khalil. *Nonlinear Systems*. Prentice Hall, third edition, 2002.
- [2] John Guckenheimer and Philip Holmes. *Nonlinear Oscillations, Dynamical Systems, and Bifurcations of Vector Fields*. Springer, 1991.
- [3] Richard M. Murray, Zexiang Li, and S. Shankar Sastry. *A Mathematical Introduction to Robotic Manipulation*. CRC Press, Boca Raton, FL, 1994.