2.004: overview

- Modeling of systems
  - Mechanical
  - Electrical
  - Electro-mechanical
    - In addition: fluidic, thermal, acoustic, pneumatic, biological, chemical, optical, …
- Control of systems
  - Feedback control of transients (speed, overshoot, steady-state error)
  - Frequency response (resonance, filters)

2.004: tools

- Laplace transform
- Linear time-invariant systems / transfer functions
- Root Locus technique for pole placement
- Compensators: PI, PD, PID, Lead, Lag, Lead-Lag
- State space
- Frequency response / Bode plots

2.004: what's next

- **Elective classes**
  - 2.12 Introduction to Robotics [Asada]
  - 2.14 Analysis and design of feedback control systems [Slotine]
  - 2.167 Hands-on marine robotics [Hover]
  - 2.71 Optics [Barbastathis]
- **Research involving controls and feedback systems**
  - Robotics (Asada, Dubowsky, Hover, Leonard, Slotine, Youcef-Toumi)
  - Instrumentation (Barbastathis, Hunter, So)
  - Neural engineering (Hogan, Slotine)
  - Bioengineering (Gossard, Kamm, Lang, So)
  - Micro & nanoscale engineering (Barbastathis, Culpepper, Kim)
  - Precision engineering (Culpepper, Slocum, Trumper)