AA ECE ME 548: Linear Multivariable Control

Prof Borden TA Tinu Spring 2020

exams: grading in progress; results ~ Mon May 11

today: ☑ ~10 min breakout discussion & follow-up

☑ mid-quarter course evaluation results

☑ HW 3 solution Q's (self-assessment due Sun May 10)

☐ Q's about lecture on "randomness"

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mid-quarter course eval results:

E E 548 A, Joint with A A 548 A, A A 548 B, E E 548 B, M E 548 A, M E 548 B
Linear Multivariable Control
Course type: Online

Evaluation Delivery: Online
Evaluation Form: Z
Responses: 21/31 (68% high)

Taught by: Atinuke Ademola-Idowu, J. Connery, Sam Burden
Instructor Evaluated: Sam Burden-Assist Prof

MID-QUARTER FEEDBACK

	N	Excellent	Very Good	Good	Fair	Poor	Very Poor	Median
My ability to engage with course concepts is:	21	24%	24%	38%	14%			3.4
My ability to keep up with course requirements and assignments is:	21	14%	38%	33%	10%	5%		3.6
My instructor's communication regarding course requirements and assignment is:	21	48%	29%	14%	10%			4.4
My instructor's responsiveness to student questions and concerns is:	21	67%	19%	10%	5%			4.8

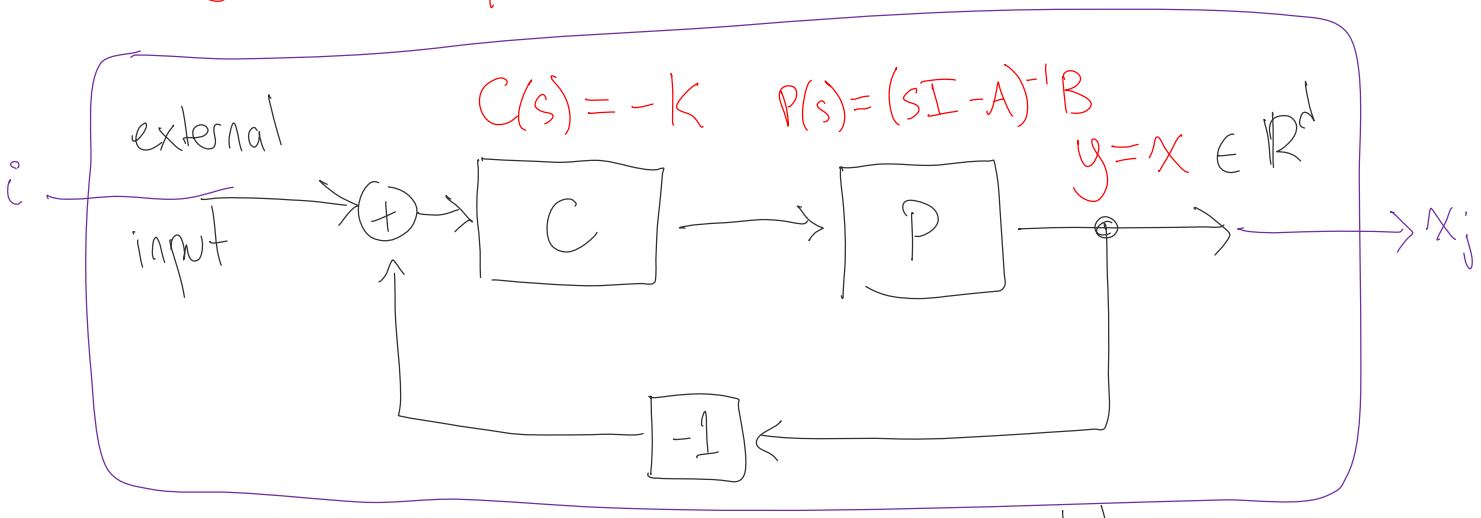
From where are you engaging with this course this quarter? **(N=21)**

76%	**US: Greater Seattle Metropolitan Area**		**International: North America (not US)**
14%	**US: Washington State outside of the Seattle area**		**International: South America**
5%	**US: California or Oregon**		**International: Africa**
	US: Alaska or Hawaii		**International: Asia**
	US: Mountain time zone		**International: Australia**
	US: Central time zone	5%	**International: Europe**
	US: Eastern time zone		

- ☐ it's hard to Zoom all day (i.e. 548 isn't your only class)
- ☐ pre-recorded lectures + Zoom meetings = a lot
  (but: asking Q's in Zoom meetings is helpful)
  → I'm going to try to have lighter lecture + HW load
- ☐ short lectures (~15–30 min) are nice
  but more examples/exercises would be helpful...
  → I'm going to include more exercises, but not solve them
- ☐ this is a very stressful/challenging time
  (but: flexible deadlines help a bit)

stability (gain & phase) margins for MIMO systems

→ eg exam 1 problem 2 (d, e)



- open-loop xfer matrix $L = PC \in \mathbb{R}^{d \times d}$
- sensitivity " " $S = (I + PC)^{-1} \in \mathbb{R}^{d \times d}$

* "loop-at-a-time" analysis of stability / sensitivity
  (a) makes sense but (b) doesn't give complete picture

↳ to get a handle on MIMO robustness,
we will quantify system-level norms (H_2, H_∞)