<u>E157 Lecture 1 Day Plan</u>

Welcome

Why are you taking this class?

- Cell phones – Antennas don't work without RF theory.
- The internet – fast signals require specially designed wires to carry them. Important in DRAM, fiber optic base planes, etc.

Why do we need this class? What physics are different for fast RF signals

- big L impedance and small C impedance → often low power
- the speed of light affects fast-changing signals.
- You don't have any models for radiation yet

How does this class work?

- Still in beta – upgrading and merging labs this year, video updates in future, materials will be updated, so don't go more than a week ahead.
- Videos
- Quizzes – solo + team
- Post-quiz during Lecture – Activities, Some office hours
- Labs –
    - practice questions, theory questions, the lab itself
    - Questions do not have their own writeup, append to start of lab
    - Deliverable is a lab notebook
        - Not text heavy
        - Is _results heavy_ and _setup/replication_ heavy
        - Make sure to include mandatory data
        - Nominally chronological, we bend a bit here
    - Most important goal is matching model / simulations / theory
    - Two-week Cadence, don't fall behind!
    - Partners measure together, write-up separately
- Design projects
    - Like open ended labs
    - Deliverable is a templated report
    - Same deal with partners
- First lab will require you to get RF lab certified, schedule w/ me/Xavier

Logistics time: Partners, dedicated lab hours, office hours, grading, cert appointments

Lesson

- This is preparation for certification. Read RF lab rules too.
- Major ways to break instruments: DC biases, Power levels, Mechanical (cables)
- dBm is 10*log(P1/1mW). RMS reminder.
- Look at some crappy cables and some good cables. Mating planes. Construction.