

## E157 Lecture 14 Day Plan

### Mid-semester review debrief

- What did you think of breather class after matching networks? Can we trade for more spread out power gain / stability series?
- 1 respondent, can't draw trends, but ask about practical questions, labs

### Exam format:

- 1,25 hrs, closed book, closed note, no calculator
- Allowed 1 page 8.5"x11" cheat sheet that can be marked front and back.
- I'm Not big on memorizing weird equations, you'd just look them up in real life
- We will use basic equations ... Gamma, Q, Smith ... a lot
- Beware the lecture after the exam – auto full credit on quiz

### Review – guided recall of topics and questions, clarify topics.

- Transmission lines
  - Wave equations, differential models of transmission lines
  - Propagation equations, alpha and k
  - Reflection coefficient and driving point impedance
  - Terminated transmission lines with square pulses
  - Terminated transmission lines with sine waves → VSWR
  - Delayed terminations → Impedance transformation and generalized Gamma
- Smith Charts
  - Coordinates and basic use. Plotting a load on the Smith Chart
  - Effect of R, L, C, tline on the location of a load on a Smith Chart
- Matching networks
  - Behavior on Smith Chart
  - Quality factor definition and measurement,
  - Series-to-parallel transformations
  - Design one
- Filters
  - Specs definition: insertion loss, ripple, stop band edge/rejection, pass band edge
  - Types and behaviors: Butterworth, Cheb I, Cheb II, Elliptic
  - Filter prototype
  - Relation between polynomial, pole-zero plot and frequency response
- S-parameters
  - Basic definitions
  - Measurement → couplers, VNA guts, calibration
  - Power flow → Types of power gain, power is ~ S-params squared, how much power?
  - Stability → circles, Rollett (unconditional if  $>1$ ), geometric (stable if both  $<1$ )

### Some practice problems:

- Questions from practice exam? Some power gain review including word probs from lec 12.