Lecture 23 -- Op-Amp Design

Draw a rough schematic for a typical 3-stage op-amp. What op-amp property is each stage responsible for?

What are 3 important design specifications for op-amps? How does the fact they're used in feedback affect the specs we care about?

Why does the fact that op-amps are used in feedback mean that we need to be careful about the design of our gain stage? How is that design related to slew rate?

What is stability?

How can we have observed instability even though our systems so far have been designed with left half-plane poles and no explicit feedback?

What is a root locus, and why do we use root locus techniques?

What is open-loop gain? Closed-loop gain?

What is the closed-loop gain of an op-amp in feedback? The desired gain? The steady state error? For what values of L(jw) will our amplifier be guaranteed to be unstable?

How is crossover in a Bode plot of the loop gain related to stability?

What is phase margin?

Does an op-amp have greater phase margin when it is configured for unity gain or when it is configured for a gain of Acl?

What is op-amp compensation? How does it relate to gain-bandwidth product?