

Review (Pre-Final)
ELEC 312 (W0809)

Differential Amplifier

- AC operation with discrete load (fully diff., balanced diff., single in diff. Out, Common mode rejection)
- AC operation with active load (diff. In single out)
- Different kinds of active loads



Multistage Amplifier

- Diff. Amp, CE, CB, CC (CS,CG,CD for MOS) stages
- Overall gain calculations – take note of the loading at the inter-stage coupling
- Input, output resistance calculations

- Concepts of 3dB frequencies, dominant poles
- Expressing the gain as $A_M A_L A_H$
- Calculations for high-frequency gain (OCTC, Full Transfer function, use of Miller's effect principle)
- Frequency response of h_{fe} (~relates to transition frequency)
- Cascode and other compound stages for improved high frequency response
- Gain- bandwidth calculations

Frequency Response of Amplifiers

Negative Feedback Systems



- Four types of feedback connection
- Related two-port circuit and equation models (only three parameters are important)
- Calculations with 'loaded' amplifier (pay attention to proper unit of the loaded gain)
- Use of the four basic amplifier equivalent circuit models (VCVS, CCCS..)
- Stability in negative feedback
- Gain margin, phase margin related calculations

Output Stages



- **DIFFERENT DC BIASING**
- **EFFICIENCY CALCULATIONS IN CLASS A AND CLASS B AMPLIFIERS**
- **BASIC SCHEMATICS OF CLASS A, B AND AB STAGES**
- **CLASS AB BIASING – CALCULATIONS**
- **DIFFERENT CLASS AB CONFIGURATIONS INCLUDING VBE MULTIPLIER, COMPOUND STAGES**
- **HEAT DISSIPATION CONSIDERATIONS**

Filters & Tuned Amplifiers

- Transfer function calculations
- Band-edge frequencies and Bandwidth calculations

Oscillators

- Barkhausen condition
- Wein Bridge, Phase shift , Colpitt's and Crystal oscillators
- Analysis using loop-gain concept
- Analysis using Nodal Admittance and Constraint equation methods

GOOD LUCK !
