Examination Feedback for EEE331/6037 – Analogue Electronics
Spring Semester 2010-11

Feedback for EEE331/6037 Session: 2010-2011

Feedback: Please write simple statements about how well students addressed the exam paper in general and each individual question in particular including common problems/mistakes and areas of concern in the boxes provided below. Increase row height if necessary.

General Comments:

The overall exam performance of the students sitting the EEE331 exam was down compared to both previous years (–4 and –7%, respectively) while that of the EEE6037 cohort has gone up significantly (by +9%). Again, the performance was better overall in those parts that required reproduction of learned facts compared to those that asked for application of learned concepts. Questions similar to those in past exam papers were mostly answered properly, while new questions resulted in a large scatter in performance. Again a tutorial was offered this year where last year's exam was discussed in detail and which was attended by about 20 students. One reason for the low overall result may have been that this exam was on the very last day of the examination period, and students appeared to be tired.

Question 1:

All students had problems in answering question (a) on collector current vs. base current behaviour which was actually an easy question and one of the central aspects of the first year BJT lab project! They mostly confused base current and base-emitter voltage. Question (b) on temperature dependence of the transconductance was meant to be a 3-line-job but many students could not write down the Ebers-Moll equation and differentiate it. Question (c) was very long; the first and last bits of it were fairly easy but the calculation of the voltage gain should probably have been made more specific (small signals, no HF, with resistors but without capacitors). The way it was worded left room for various approximations all of which, if properly stated, were awarded full marks. Question (d) was no problem.

Question 2:

The first two questions on multiple BJT configurations were similar to last year's questions but asked for the voltage instead of the current gain of the Darlington pair (a) and a Wilson current mirror analysis (b). A lot of students confused the cascode pair in (c) with a differential amplifier. Question (d) again was no problem.

Question 3:

As in the previous years, the questions on MOSFETs were tackled only by a minority of students. Questions (a), (c) and (d) were similar to questions in previous years; (c) simply had the polarities reversed and a question on dielectric insulation added. Some students ignored the part of question (b) where the equation for a simple plate capacitor was required - it's unclear whether they did not know it or overlooked it.

Question 4:

Question (a) on leap-frog ladders had one new aspect, which was a serial connection of a capacitor and an inductor in one lag, which threw a number of students off course. The filter function in question (b) had more poles than in previous years, but they all could be (and were) tackled in a similar way; the biggest problem for the students seemed to be not the amplitude but the phase plot required as well (which was ignored by a lot of students). Question (c) on feedback theory was new and only correctly answered by a small number of students. Perhaps a practical example would have been more appropriate to tackle.