Examination Feedback for EEE6431 – Broadband Wireless Techniques
Spring Semester 2014-15

Feedback for EEE6431 Session: 2014-2015

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:

This is the first year that the module was run as a long, thin course delivered over two semesters with the final examination at the end of semester 2. The paper was set at a similar standard to previous years with slightly more challenging design elements to the questions. Over one third of the material examined was based on other parts of the curriculum that had not been examined in the previous three years. In general the majority of students found the paper challenging across all four questions and quite a large number of students could not cope with the design questions in the paper.

Question 1:

This question was attempted by the majority of students. Though the topics were similar to previous years, more emphasis was placed on proving basic principles such as the Doppler effect and the two-ray ground propagation model. Students were challenged by these proofs, which tended to drag the overall average mark for the question down. Frequently, students did not answer the question set and surprisingly supplied unrelated answers taken from past papers. Students tended to over describe basic theory when more straightforward statements would have sufficed.

Question 2:

This question tackled the topic of narrowband fading. Much of the material examined was taken from parts of the curriculum not examined previously, such as autocorrelation functions and I/Q signal sets. Again, there was a number of basic theory proofs which tended to challenge the students. This was one of the questions attempted by a large number of students, but returned a low average mark. It is worth noting that the material in questions 1 and 2 was delivered in semester 1.

Question 3:

Question 3 was a design question focused on channel impulse response characteristics and wireless channel capacity. The topic has been covered extensively in past papers but the questions were formulated with specific complex channel tap values (as covered in the class examples) but this appears to have confused a large number of students who were unable to determine the power in complex taps by calculating ($h\ h^{*}$). Another key omission was realizing the need to take the FFT of the TD channel impulse response. This question was the second most attempted while the students' performance was average.

Question 4:

Like question 3, this question also tested the design capabilities of the students by focusing on the characteristics of wideband communication systems such as OFDM and CDMA. Far fewer students attempted this question and only a few did exceptionally well. Students were particularly challenged by Q4(b) using the FFT to calculate the transmitted OFDM signal for an all ones BPSK data stream as well as struggling to perform related signal calculations for the RAKE receiver in Q4(d).