General comments on EE2-6 Control Engineering paper 2014

1. The students have done well on this question, scoring approximately 68%.
   (a) This is a mechanical system modeling question and is a typical study group question.
      i. Typical study group question.
      ii. Typical study group question, a bit tricky since it asks for marginal stability.
      iii. Typical study group question.
      iv. Typical study group question.

   (b) This is a Nyquist diagram/Routh-Hurwitz question and is somewhat typical of study group questions.
      i. Typical study group question.
      ii. Typical study group question.
      iii. Typical study group question.
      iv. A bit tricky since the given compensator is complex.

2. This question combines knowledge about Nyquist analysis and the Routh-Hurwitz criterion in a slightly non-standard way for compensator design since it involves model uncertainties. The students did less well on this question, scoring an average mark of 60%.
   (a) Standard study group question, although needs a little thought to get around the uncertainties.

   (b) Standard study group question.

   (c) Standard study group question.

   (d) Tricky since it needs an understanding of the nature of the uncertainty.

   (e) Needs a good understanding of the difference between the different types of compensator.

3. This is a root-locus type design question. The structure of the controller was nonstandard, although mentioned in the lectures. The students did poorly on this question, scoring approximately 45%.
   (a) Standard study group question.

   (b) This is standard design requirement, but for the nonstandard structure.

   (c) This is standard design requirement, but for the nonstandard structure.