S-72.341 CODING METHODS

Tutorial 6

1. (Wicker, problem 8.1) Consider a binary narrow-sense BCH code of length 15 and design distance 3.
   a) Compute a generator polynomial for this code.
   b) Determine the rate of this code.
   c) Construct generator and parity-check matrices for this code.

2. (Wicker, problem 8.2) Compute a generator polynomial for a binary narrow-sense BCH code of length 15 and design distance 4. What is the rate of this code.

3. (Wicker, problem 8.3) Compute a generator polynomial for a binary BCH code of length 15 and design distance 4. Maximise the rate of the code through appropriate selection of the consecutive roots, then compare the results to the solution to the previous problem.

4. (Wicker, problem 8.6) Are there any good binary BCH codes of length 19? Provide support for your answer.

5. (Wicker, problem 8.7) Are there any good 2^9-ary BCH codes of length 19? Provide support for your answer.

6. (Wicker, problem 8.9) Consider a narrow-sense Reed-Solomon code of length 15 and design distance 3.
   d) Compute a generator polynomial for this code.
   e) Determine the rate of this code.
   f) Construct generator and parity-check matrices for this code.

7. (Wicker, problem 8.10) Compute a generator polynomial for a narrow-sense double-error-correcting Reed-Solomon code of length 31.