

**ECE 556: SPRING 2020**  
**HOMEWORK 3**  
**ISSUED: 29TH OF FEBRUARY. DUE 10TH OF MARCH.**

Note: The HW is due in class, before the start of the lecture.

- **Problem 1.** Prove that the dual of an RS code is an RS code.
- **Problem 2.** Explain how to derive the key equation for RS codes and solve it via Euclid's algorithm. For this purpose, consult the notes listed on the course website by Dr. McEliece.
- **Problem 3.** Prove Johnson's bound for list decoding stated in class.
- **Problem 4.** Explain Sudan's algorithm for list decoding of RS codes. For this purpose, consult the notes listed on the course website by Dr. Sudan.
- **Problem 5.** Prove that the minimum distance of  $r$ -th order Reed-Muller codes  $\mathcal{R}(r, m)$  is  $2^{m-r}$ .