From Chapter 4 of the text:

4.1. Construct a generator polynomial for a 3-error correcting Reed-Solomon code of length 10 over $\mathbb{Z}_{11}$.

4.2. Construct a $[4,2]$ Reed-Solomon code $C$ over $\mathbb{Z}_5$. That is, find a generator polynomial for $C$, a generator matrix for $C$, and list the elements of $C$. Find the minimum distance of $C$; how many errors will it correct?

4.5. Find a generator polynomial $g(x)$ for a $[15,11]$ Reed-Solomon code over $\text{GF}(16)$. Use $\mathbb{Z}_2[x]/(x^4 + x + 1)$ as your representation of $\text{GF}(16)$, and use the primitive root $u = [x]$.

   Note: the polynomial $g(x)$ is in $\text{GF}(16)[x]$, not necessarily $\mathbb{Z}_2[x]$.

Additional problems:

1. Construct a $[15,k]$ BCH code over $\mathbb{Z}_2$ with designed distance 5 for which $k$ is as large as possible. What is the minimum distance of the code?

2. Construct a $[15,k]$ BCH code over $\mathbb{Z}_2$ with designed distance 7 for which $k$ is as large as possible. What is the minimum distance of the code?

3. Construct a BCH code of length 8 over $\mathbb{Z}_3$ with designed distance 5.