Kodeteori, Vår 06.

Below we use the following notation:
Txbk – "Codinig theory and Cryptography" by Hankerson & others.

We may also use notations:
♢ – the proof is not obligatory,
⧫ – an important topic, the proof in particular.
Th - Theorem, Pr - Proposition, Lm - Lemma.

Content of lectures 11-13.

Lecture 11.

Vandermonde determinants: the formula.
BCH-codes: the construction.
⧫ Main theorem about minimal distance for BCH-codes.
BCH-codes over $\mathbb{F}_p$: examples, calculating dimesion.
†Txbk: 5.4, 5.5, 6.1, 6.2.
‡. In [Pless] you can consult 7.1-7.3.

Lecture 12.

Reed-Solomon codes over F.
Tranforming a Reed-Solomon code over $\mathbb{F}_{2^n}$ into a code over $\mathbb{F}_2$ writing elements of $\mathbb{F}_{2^n}$ as binary strings.
The task of correction rare bursts of errors.
The length of a burst that is possible to correct with a tranformed RS-code.
†Txbk: 6.2, 7.1
‡[Pless] does not say much on RS-codes.

Lecture 13.

The finite Fourier transform and the inverse finite Fourier tranform.
Application to RS-codes: encoding and decoding via Fourier transform.
Error correction for RS-codes: correction of one and two errors.
†Txbk: 6.4 (the name Fourier transform is not used).