

ECE 447

Fall 2025

Lesson 22

Digital

Communication and Line Coding

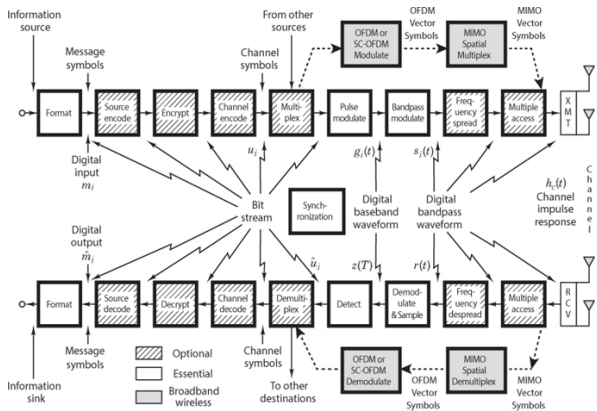
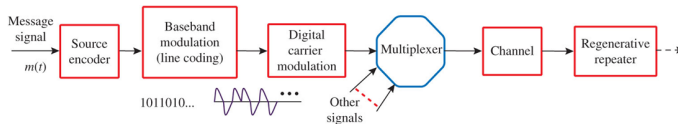


UNITED STATES
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SCHEDULE AND ADMIN

- [Schedule](#)
- Admin
 - **HW3.** Grading...
 - **HW4.** Posted on course website. Due T23 (14 Oct).
 - **Lab 4.** Due M25 (17 Oct).

DIGITAL COMMUNICATION SYSTEMS

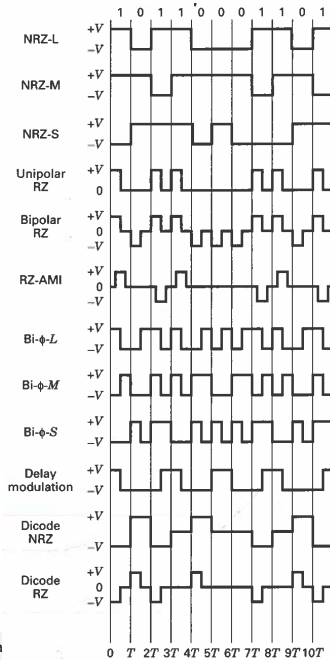
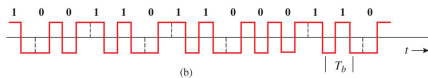
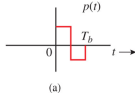
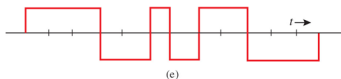
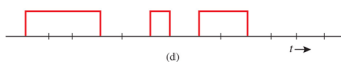
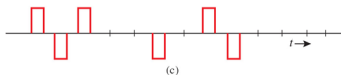
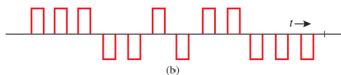
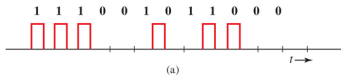


BASEBAND LINE CODING

Desired line code properties:

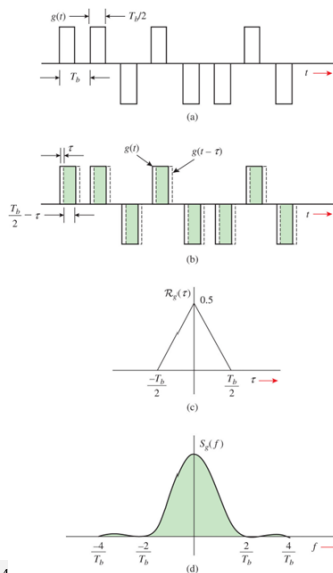
- Low bandwidth
- Power efficiency - low tx power for given bandwidth and error detection rate
- Error detection/correction capability
- No DC content
- Timing info (self-clocking)
- Transparency

TYPES OF LINE CODES



LINE CODE PSDs

Example 3.24 - Our good friend, Autocorrelation!



LINE CODE SPECTRA

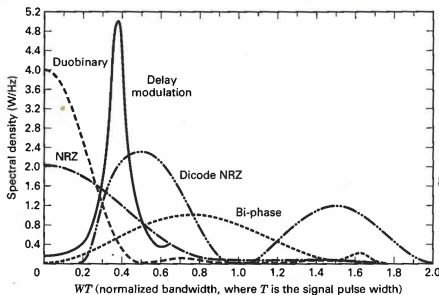
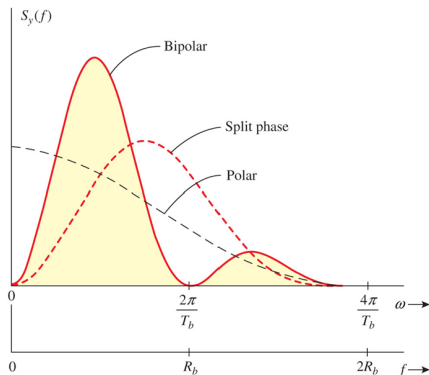


Figure 2.23 Spectral densities of various PCM waveforms.

LINE CODE TO BASEBAND WAVEFORM

