Information theory and coding (recommended subject)

- Entropy, relative entropy, mutual information. Fano's inequality. Entropy in continuous case.
- Uniquely decodable codes, prefix codes, Kraft-McMillan inequality, bounds on the optimal code length. Optimality of Huffman codes.
- Channel capacity and channel coding theorem.
- Error correcting codes. Linear codes, generator matrices, parity check matrices

Literature:

- Cover, Thomas, and Joy Thomas. Elements of Information Theory. 2nd ed. New York, NY: Wiley-Interscience, 2006. ISBN: 9780471241959.

- Gallagher, Robert. Information Theory and Reliable Communication. New York, NY: Wiley, 1968. ISBN: 9780471290483.