ELEC-E7240 Coding Methods D (5 cr) spring 2023

Lectures

The lectures take place on Mondays 12–14 (TU3, Wärtsilä, Maarintie 8) and Wednesdays 10–12 (AS3, Saab Space, Maarintie 8) and are given by Prof. Patric Östergård (patric.ostergard@aalto.fi).

Date	Topic
09.01	Introduction
11.01	Algebra I
16.01	Algebra II
18.01	Linear Codes I
23.01	Linear Codes II
25.01	Cyclic Codes
30.01	BCH and Reed-Solomon Codes
01.02	Convolutional Codes I
06.02	Convolutional Codes II
08.02	Modern Coding Methods I
13.02	Modern Coding Methods II, Channels with Feedback
15.02	No lecture (spare lecture slot)
22.02	Exam

The official course literature is

[Wic] S. B. Wicker, *Error Control Systems for Digital Communication and Storage*, Prentice-Hall, Upper Saddle River, NJ, 1995.

and, for turbo and LDPC codes,

[CF] J. Castiñeira Moreira & P. G. Farrell, *Essentials of Error-Control Coding*, Wiley Chichester, UK, 2006.

The lecture slides are perhaps the most important source of information.

Exercises

The exercises take place on Thursdays 14–16 in (T5 = A133, Computer Science Building) and are given by the course assistant Dr. Daniel Heinlein (daniel.heinlein@aalto.fi). The exercises consist of homeworks and tutorials. The homeworks are graded and the total number of points is obtained from the percentage of correct solutions divided by 8 (that is, maximum is $100/8 = 12.5$ points).

Date	Topic	Homework deadline
12.01	Introduction	19.01
19.01	Abstract Algebra	26.01
26.01	Linear Codes	02.02
02.02	Cyclic, BCH, Reed–Solomon Codes	09.02
09.02	Convolutional Codes	16.02
16.02	Turbo Codes, LDPC Codes	No homework

Exam

Since 2022, the exam has been shorter than in earlier years. There are two possible dates for taking the exam: 22.02.2023 and a retake exam in May.

Grading

The course is passed by returning the homeworks and taking the exam. The maximum number of points is 24.5 = 12 (exam) + 12.5 (homeworks). Grading (after rounding to the closest integer):

Grade	Points
0	0–9
1	10–12
2	13–15
3	16–18
4	19–21
5	22–24